

SEPTEMBER 2, 1961

# Chemical Week

A McGRAW-HILL PUBLICATION PRICE FIFTY CENTS



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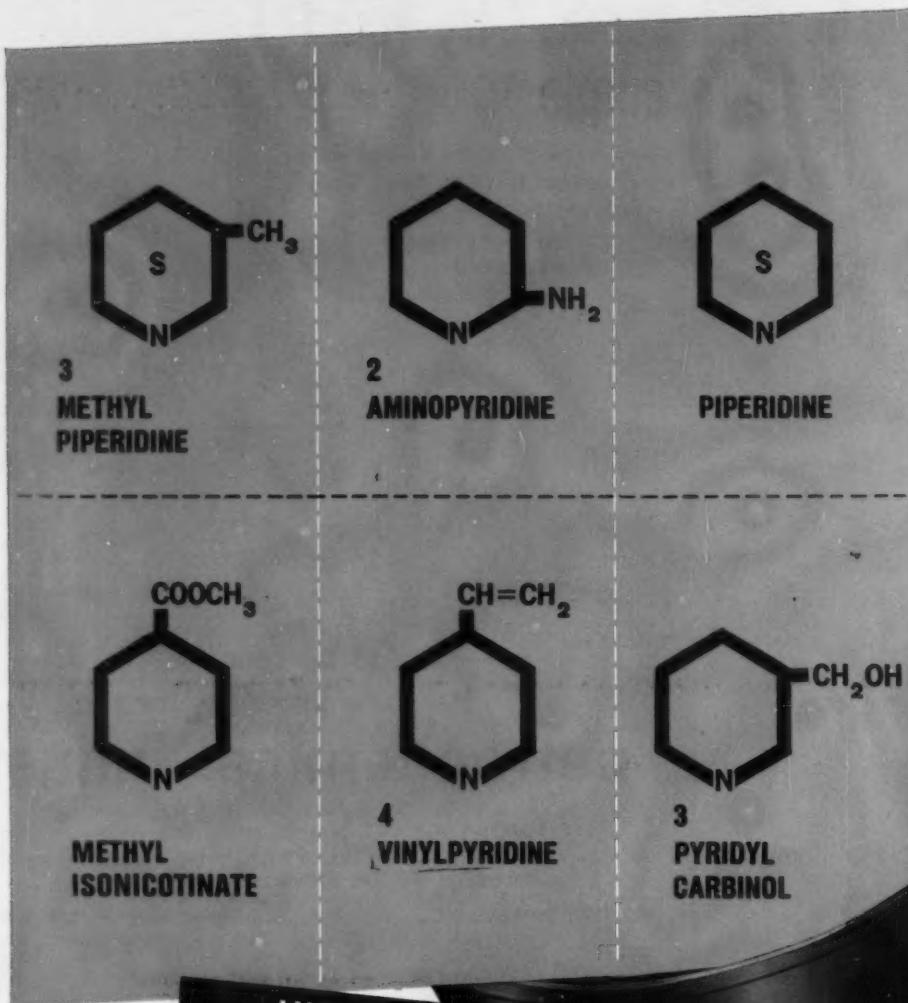
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**ON THE COVER:** Bob Weber's fanciful cartoon of employees who've made the most of management's desire to avoid strikes is a humorous interpretation of a serious issue (p. 34).



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# Take it from operators at Shell's biggest refinery, "F&P controllers hold true...don't drift"



Rear of control panel, showing Fischer & Porter plug-in controllers. These miniature units utilize pneumatic set-point and process input signals.

Fischer & Porter 2,000 pounds per day chlorinator servicing cooling tower at Wood River Plant. This is one of many F&P instruments used throughout the refinery.



## Fewer control adjustments at Wood River simplify entire trickle hydrodesulfurization job

Precise control . . . easy servicing . . . virtually no adjustments . . . these advantages are winning orchids for F&P controllers at the trickle hydrodesulfurization unit of Shell Oil's Wood River Refinery. Operators report that these board and miniature instruments "control just about perfectly—don't drift—seldom need re-setting or maintenance."

### Sulfur removal reaches 96%

Largest of Shell's refineries, Wood River desulfurizes distillates from cat cracking operations. The unit was designed for 25,000 bbl. per day at a system pressure of 600 psi. Hydrodesulfurization is completed through two basic interconnected operations: (1) reaction phase with hydrogen gas, and (2) fractionation, with the resulting finished oil to storage. The sulfur removal from this liquid-phase-type processing has reached as high as 96%.

### Two years operation without a hitch

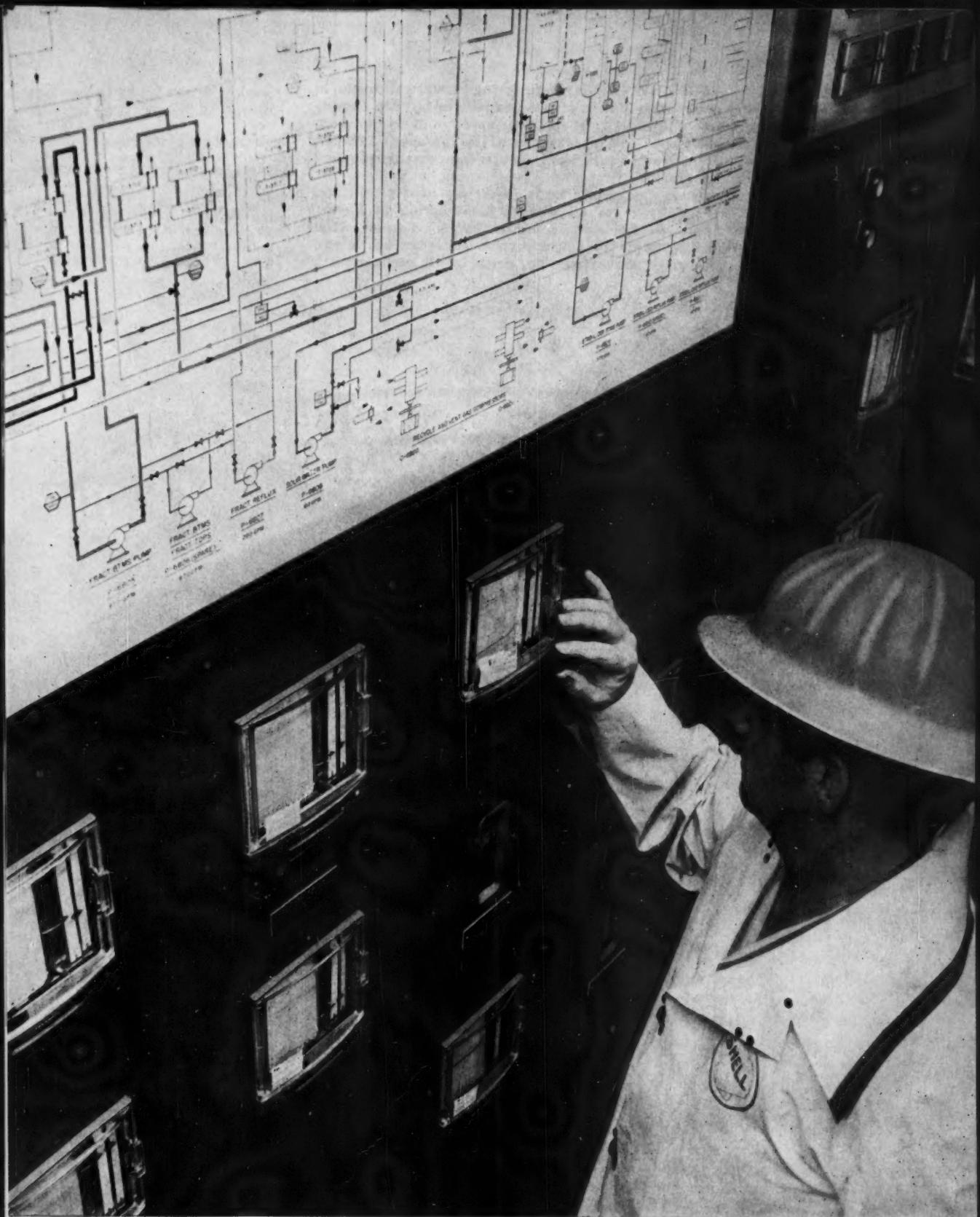
"Tending store" for this process, conscientious Fischer & Porter miniature strip chart recorders and plug-in controllers keep an eagle eye on the key process variables. The "semi-graphic" control panel pictured on the opposite page contains schematic flow diagrams mounted at the top of each section, with the Fischer & Porter recorders spotted in the lower portion. Result of their seldom interrupted vigilance—since July 1959, when the unit went on stream—is smooth, accurate processing with top-notch efficiencies and trouble-free control.

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Control panel for the Shell Trickle Hydrodesulfurization Process at Wood River Refinery of Shell Oil Company.

Construction: Procon Inc., Des Plaines, Ill.  
Panel Instrumentation: Fischer & Porter, Warminster, Pa.

**Gas reforming hits a new high** Engineering news was made in France recently, when a Chemico high-pressure gas reform furnace operating at 250 psi was placed on stream. Prior to the completion of this project, no gas reformer in the world had ever operated at pressures above 175 psi. Design innovations incorporated in this plant reduce compression requirements and increase heat recovery.

This historic breakthrough in gas reforming is indicative of the skill and experience which Chemico brings to all process engineering problems. Chemico services to clients in the process industries range from initial laboratory research and testing to final construction and start-up. If you are interested in learning more about Chemico, write to "Department B".



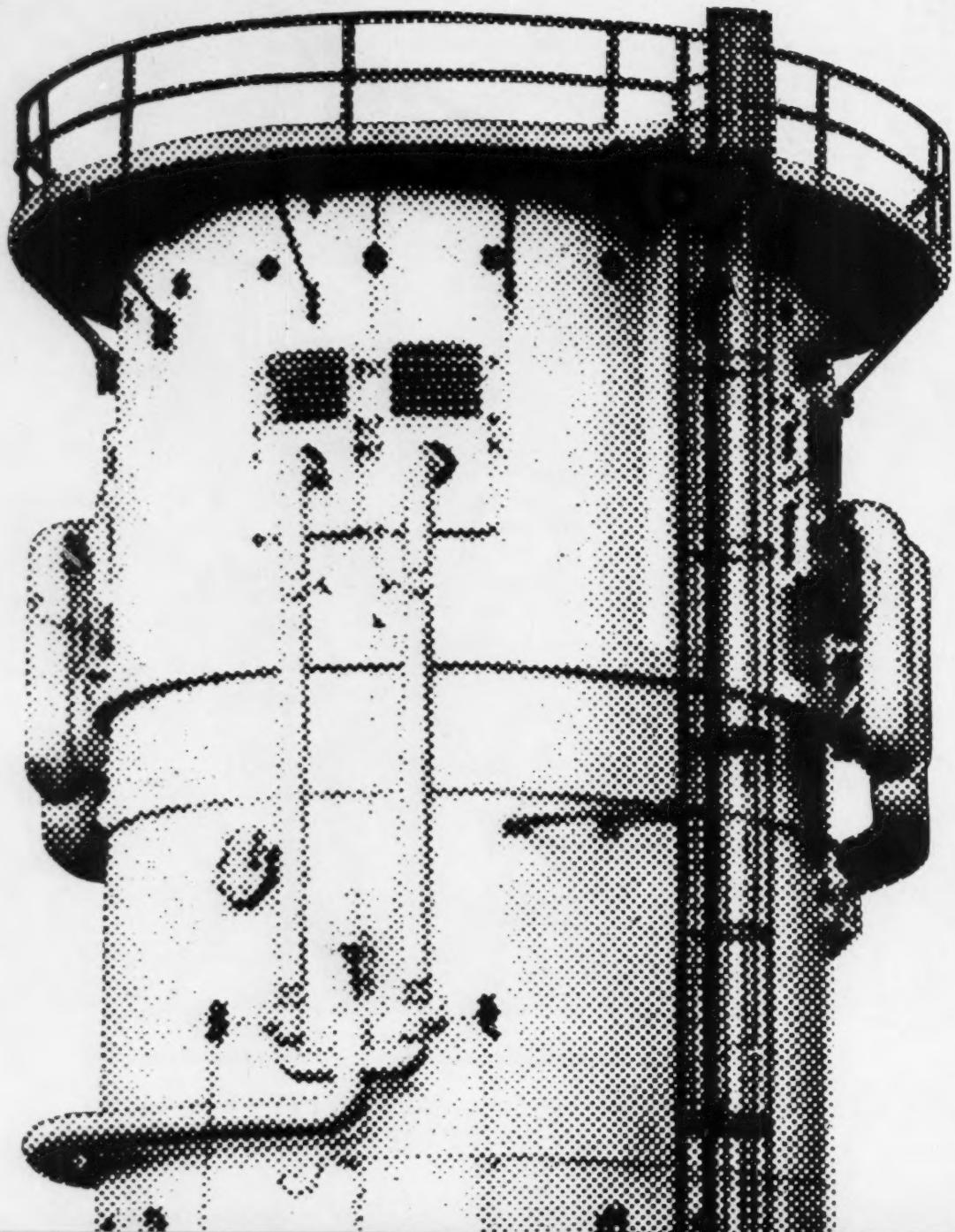
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THE CHEMICAL INDUSTRY and the steel industry have enough in common so that each can learn from the other; and significant lessons can be learned from the recent statement of U.S. Steel's Executive Vice-President R. Conrad Cooper to a subcommittee of the House Committee on Education and Labor. His subject: the impact of imports and exports on American employment.

The steel industry long enjoyed—as the chemical industry has and still does—a comfortable margin of exports over imports. Not until '59, the year of the long steel strike, did the balance reverse. But what worries the industry is that the trend toward reversal started in '58, before the strike, and the reversal has persisted throughout '60 and so far in '61—long after the strike ended. In '50 U.S. exports accounted for 15% of world steel trade, but by '60 the figure had declined to 7%. Conversely, U.S. imports, which amounted to a mere 1.5% of domestic supply in '50, rose in '60 to 5% of domestic supply.

The decline in exports is largely due, of course, to the establishment and growth of steel industries in foreign countries, freeing them from dependence on U.S. products. The decline in exports is likely to continue as Japan, the Common Market countries and other nations continue to build capacity at a faster percentage rate than the U.S.

But the increase in imports is due to the ability of foreign producers—with modern and efficient plants and paying lower wages—to sell some steel products here in the U.S. at lower prices than charged by local producers. We import almost one-third of our wire rods, over two-fifths of our nails and staples, over half of our barbed wire.

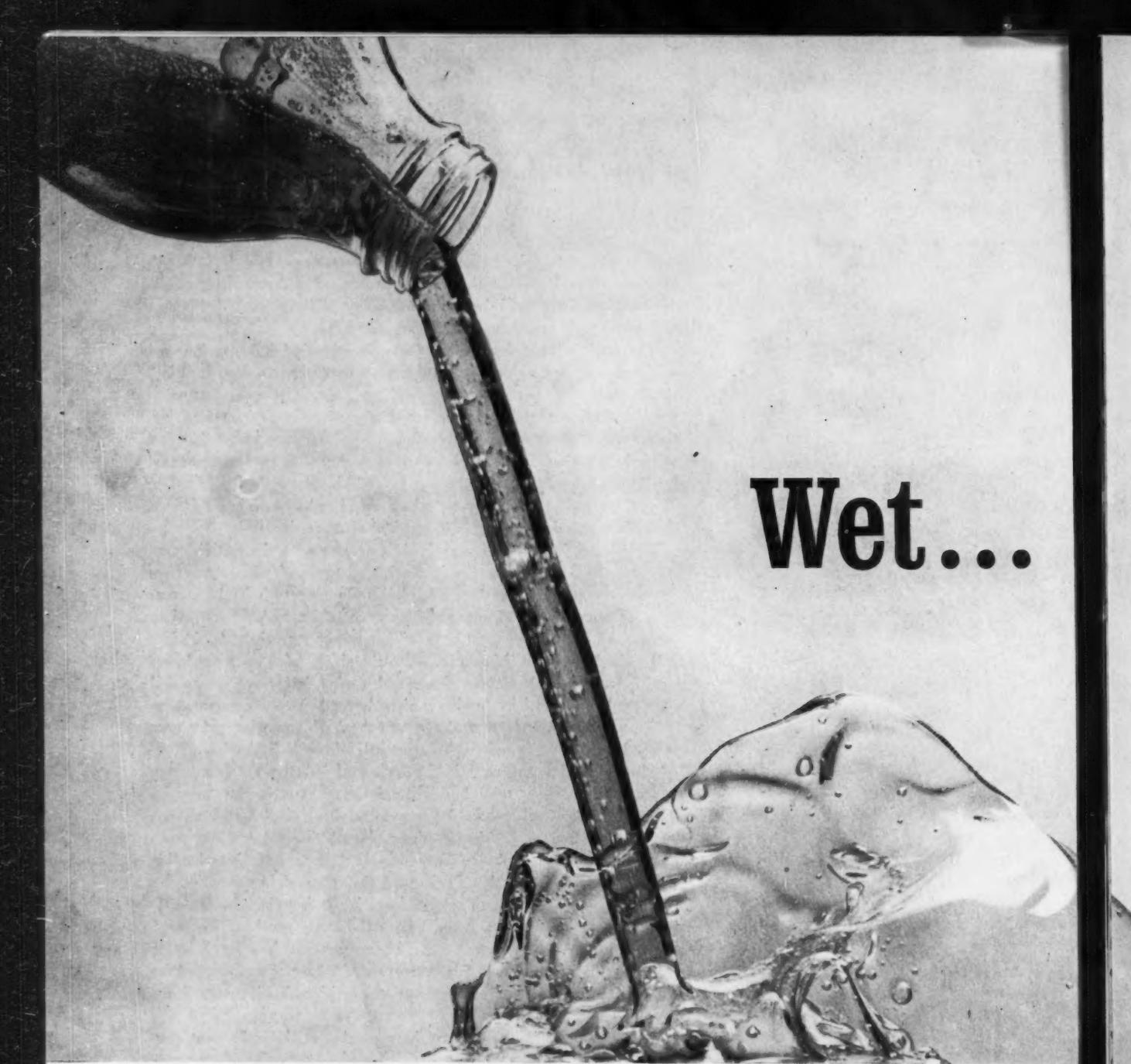
"Hourly employment costs in the U.S. steel industry are from three to nearly seven times total hourly employment costs in the countries of the European Coal and Steel Community, the United Kingdom, and Japan," says Cooper. "It is sometimes alleged that employment costs of steel workers abroad are increasing at faster rates than in this country. The facts are that in four of the other eight countries the rate was lower. . . . Even more significant is the fact that the competitive disadvantage of the U.S. in dollars and cents per hour increased substantially in every case. . . . Each one-percent increase in steel worker employment cost in this country would have to be matched by 7% in Japan simply to prevent our competitive disadvantage from worsening.

"Steel producers in this country have a substantial employment cost disadvantage in foreign trade, and the historic superiority of our productive efficiency is being steadily reduced as foreign steel producers match the best of the efficient, high-output facilities in this country.

"No stone is left unturned in our continuing efforts to reduce all elements of controllable cost. . . . In this effort we would welcome a more reasonable, cooperative and realistic attitude on the part of the union leaders. The total cost of an hour's work . . . has risen fantastically from an average of 91¢ in '40 to about \$4.00 today for wage employees—an increase equivalent to more than 7.3%/year compounded.

"That is quite a record of increased cost. Its significance here is that the union has been the moving force toward pricing steel workers in this country out of their jobs. . . ."

Through research, the steel industry—like the chemical industry—is continually boosting its productivity. And it must; since, if wage gains continue to outrun productivity gains, its competitive position will deteriorate even further. And the same is true of our industry.



# Wet...

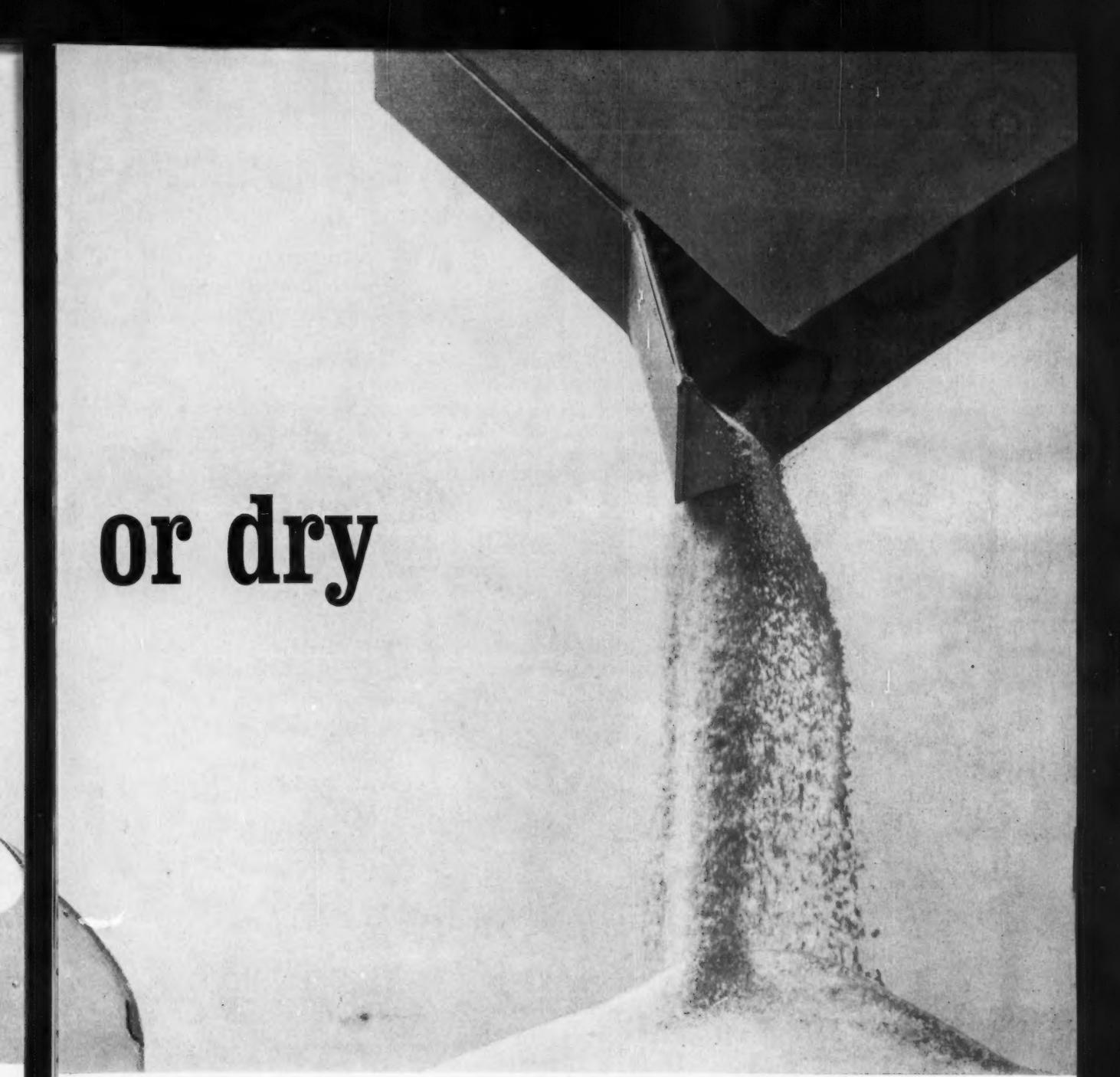
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## LETTERS

### No Key Draftees

TO THE EDITOR: In your article, "Call to Arms Sparks Manpower Survey" (Aug. 12, p. 56), you state: "Fritzsche Bros. finds that only 1% of its employees are 'eligible for the draft.' Fritzsche, too, is worried about replacements for key jobs."

While the first part of this statement is essentially correct, we feel that its latter portion is misleading. Our firm is not at all apprehensive over a possible drafting of key personnel because, at the present time, we have no men in such positions who are eligible for military draft. . . .

WALTER WIEN  
Sales Promotion Director  
Fritzsche Brothers, Inc.  
New York

### Fractured French—Again

TO THE EDITOR: This correspondence is getting funnier by the minute. Mr. Henry Fischbach's rendering seems acceptable, except that he writes (or is it the printer's goof?) all the words with accents graves instead of accents aigus. For example, it is not "publicité" but "publicité," etc. . . .

FREDERICK NETTEL  
Consulting Engineer  
New York

*Reader Fischbach is innocent; the printer is not.—ED.*

### Cyclododecatriene

TO THE EDITOR: Your cyclododecatriene article (Aug. 5, p. 93) was interesting and well-written. You deserve the appreciation for this synopsis from those of us interested in this field of new and exciting chemistry.

WILLIAM H. LOWDEN  
Enjay Chemical Co.  
Elizabeth, N.J.

### Home Glue Pioneer

TO THE EDITOR: Your home glues article (April 29, p. 73), purporting to tell the story of the \$45-million household adhesives market, perpetrates an astonishing omission.

In reporting "who's in the field" you recognize the "big guys," the "big little guys," and even some guy who isn't in the business yet, but complete-

ly ignore the world-famous David among these Goliaths—the Miracle Adhesives Corp.—that started it all back in April '47 when *Reader's Digest* proclaimed . . . "Sticky Miracle In A Tube; A Handy New Adhesive Does Scores of Household Jobs."

Frank Perry, a Newark, N.J., distributor of building materials, and Lloyd Cutler (then, as now, head of Miracle Adhesives) unquestionably pioneered this market with the product enthusiastically hailed in that magazine article for "its versatility and ease of use, plus the fact that it is on sale across the nation in hardware and dime stores."

Still the most famous of all "home glues," Miracle Black Magic (together with the household adhesives industry) was born in '37, when a New Jersey industrial chemist was working with certain synthetic resins and rubber from old tires. He wasn't being paid to develop adhesives, and when he stumbled upon this sticky formula, his bosses didn't seem interested. He then took it to Perry, who was always looking for better building techniques and saw in it a possible material for affixing ceramic tiles to walls and floors—replacing the cumbrous wet cement system.

Perry and Cutler invested in perfecting the formula, the Miracle Adhesives Corp. was born, and before too long the product was being used by the thousands of gallons by the U.S. Navy, as well as millions of tubes in American homes, workshops and garages.

Any article on the "home glues" industry is certainly incomplete without some reference to these facts and to the current status of the Miracle Adhesives Corp.—the biggest "little guy" of all.

FRANK BUTLER  
Cayton, Inc.  
New York

*CW* welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

## MEETINGS

**International Superphosphate Manufacturers' Assn.**, technical conference, Wiesbaden, Germany, Sept. '61.

**American Chemical Society**, 140th national meeting, Chicago, Sept. 3-8.

**National Chemical Exposition**, 11th, International Amphitheater, Chicago, Sept. 5-8.

**Pharmaceutical Manufacturers Assn.**, International Section, Broadmoor Hotel, Colorado Springs, Col., Sept. 6-8.

**Technical Assn. of the Pulp and Paper Industry**, 11th corrugated containers conference, St. Francis Hotel, San Francisco, Sept. 6-8.

**The Combustion Institute**, Western states section, 1961 fall meeting, University of California, Berkeley, Sept. 7-8.

**Chemical Market Research Assn.** meeting, Lake George Sagamore Hotel, Bolton Landing, N.Y., Sept. 10-12.

**American Mining Congress**, metal mining-industrial minerals convention, Seattle, Wash., Sept. 11-13.

**National Industrial Conference Board**, international industrial conference, Fairmont Hotel, San Francisco, Sept. 11-15.

**Instrument Society of America**, 16th annual instrument-automation conference and exhibit, Memorial Sports Arena, Los Angeles, Sept. 11-15.

**Southeastern Plant Engineering and Maintenance Seminar**, third annual, Town Hall, Greensboro, N.C., Sept. 12-14.

**Conference on new-product development** in the field of high-polymer coatings, Engineering Extension at the University of California, UCLA campus, Sept. 12-15.

**National Petroleum Refiners Assn.**, fall meeting, Hotel Traymore, Atlantic City, N.J., Sept. 13-15.

**Wright-Patterson AFB, Ohio, Technical Symposium**, Aeronautical Systems Division of the Air Force Systems Command, Phoenix, Ariz., Sept. 13-15.

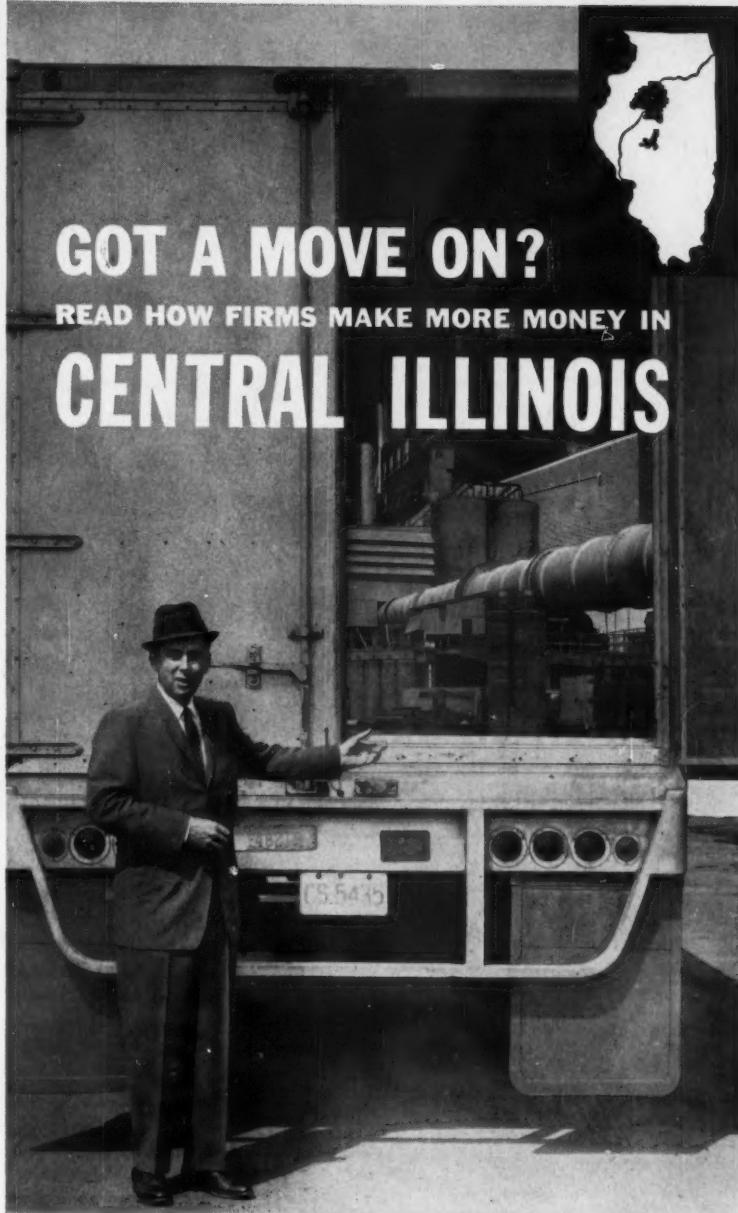
**Armed Forces Chemical Assn.**, 16th annual meeting, Statler-Hilton Hotel, Washington, D.C., Sept. 13-15.

**Drug, Chemical and Allied Trades Assn.**, 71st annual meeting, Pocono Manor Inn, Pocono Manor, Pa., Sept. 14-17.

**Natural Gas Processors Assn.**, Rocky Mountain regional meeting, Northern Hotel, Billings, Mont., Sept. 14.

**American Society of Mechanical Engineers**, joint engineering management conference, Roosevelt Hotel, New York City, Sept. 14-15.

**Technical Assn. of the Pulp and Paper Industry**, third Evolutionary Operation (EVOP) course, Schine Inn, Chicopee, Mass., Sept. 15-16.



**Hyster Company**, which expanded its plant in 1956, has found Peoria an ideal factory location since 1936—well-centered for domestic sales of truck and tractor products. Also, communication and transportation facilities make it advantageous to headquartered Hyster's International Division at the same factory.

**B. F. Goodrich Chemical Company** needed a dependable underground water supply and chose a plant site on the Illinois River at Henry, Ill. Important extra advantages discovered there include a dedicated labor force and favorable local and state tax climate.

**Super Valu Stores, Inc.** located a food distribution center in Central Illinois' new Pioneer Industrial Park—an ideal central location to serve the 500,000 surrounding population. Served by ample rail and truck facilities, Super Valu supplies independent super markets throughout the Midwest from this new distribution center.

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Mark B. Townsend  
Area Development Director

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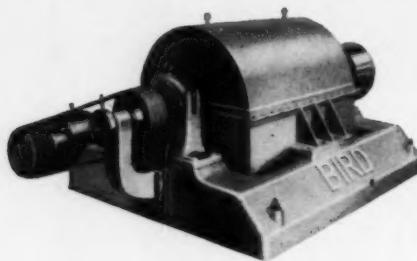


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# Business Newsletter

CHEMICAL WEEK  
September 2, 1961

**The Administration's tax reform bill is dead for this year.** It was killed by the emphasis on increased defense expenditures, and by an economic recovery that made stimulation of business less urgent than when the President presented his proposal to Congress earlier this year. Actually, the program met early opposition from business (*CW Depreciation Report, Mar. 25, p. 111*) and not much enthusiasm from anyone else.

A plan to "perfect" the reform bill "technically," for the '62 session was discussed last week at an unusual meeting in the White House that was attended by Treasury Secretary Dillon and Democratic members of the House Ways & Means Committee. The discussion centered on reviving this year's proposals to grant tax credits for money spent on plant and equipment, tax-withholding on dividends and interest, and tightened treatment of expense accounts and taxes on overseas subsidiaries. Good bet: the Administration may incorporate these measures in a beefed-up over-haul of the tax structure next year.

•

**Another CPI marriage is in the works.** Cities Service and Columbian Carbon disclosed late last week that their respective boards had approved a merger plan that represents "an important step forward in the diversification programs of each company."

The proposal, subject to approval by stockholders and Government regulatory agencies, provides for the swap of each CC share for 67/100th of one share of no par value, cumulative convertible preferred to be issued by Cities Service. The latter's preferred will carry a dividend of \$4.40/share, will be noncallable for five years.

Columbian is big in carbon black, uses residual oil as a raw material. Tie-in with Cities Service would assure a large supply source.

•

**Add another potential king-sized petronaphthalene producer** to the growing U.S. lineup (see p. 71). Texaco, this week, said it will build a "multimillion-dollar," 100-million-lbs./year plant at its Port Arthur, Tex., refinery, for operation "on or before '63."

At present, only Ashland Oil & Refining's Catlettsburg, Ky., unit is turning out the petroleum-derived product, but plants are being built by Sun Oil at Toledo, O., and Collier-Tidewater at Delaware City, Del. (a Los Angeles plant is still under consideration by the latter).

When all slated units are in operation, total U.S. petronaphthalene capacity will soar to about 500 million lbs./year. This, plus the estimated 650 million lbs./year of coaltar capacity in the U.S. leads to one inevitable conclusion—a naphthalene market glut is shaping up.

## Business

### Newsletter

(Continued)

**Sun, reportedly, hasn't dropped its contemplated plans** for a 125-million-lbs./year petronaphthalene plant at its Marcus Hook, Pa., refinery (*CW Phthalic Anhydride Report, Dec. 10, '60, p. 92*). Chances are, though, the company will wait until after the Toledo operation comes in (due Dec. '61), then take another look at naphthalene marketing possibilities before deciding on a Marcus Hook project.

**A commercial push for polypropylene fiber** is apparently behind the Enjay Chemical-J. P. Stevens & Co. acquisition of National Plastic Products (Odenton, Md.). Enjay and Stevens have been working for more than a year on a joint polypropylene textile fibers research project, which includes a pilot-plant operation at Stevens' Garfield Research Laboratory.

National now makes polypropylene monofilament, but under the new setup will expand into multifilaments, staple and fibers. Details aren't available on the acquisition of National's operating assets and facilities (including a Canadian subsidiary), but it probably was on a cash basis. National was privately owned.

**Another big Canadian potash project in the works.** Last week U.S. Borax & Chemical and Homestake Mining Co. disclosed a joint venture to "complete studies relating to a possible large-scale potash production" at Saskatchewan. A couple of weeks ago (*CW Business Newsletter, Aug. 19*) International Minerals & Chemical reported a \$10-million expansion was planned for its potash operations in the area.

**A lusty outlet for Dow's Dowgard Full-Fill Coolant.** American Motors says that all of its '62 model cars will be "equipped" with the system.

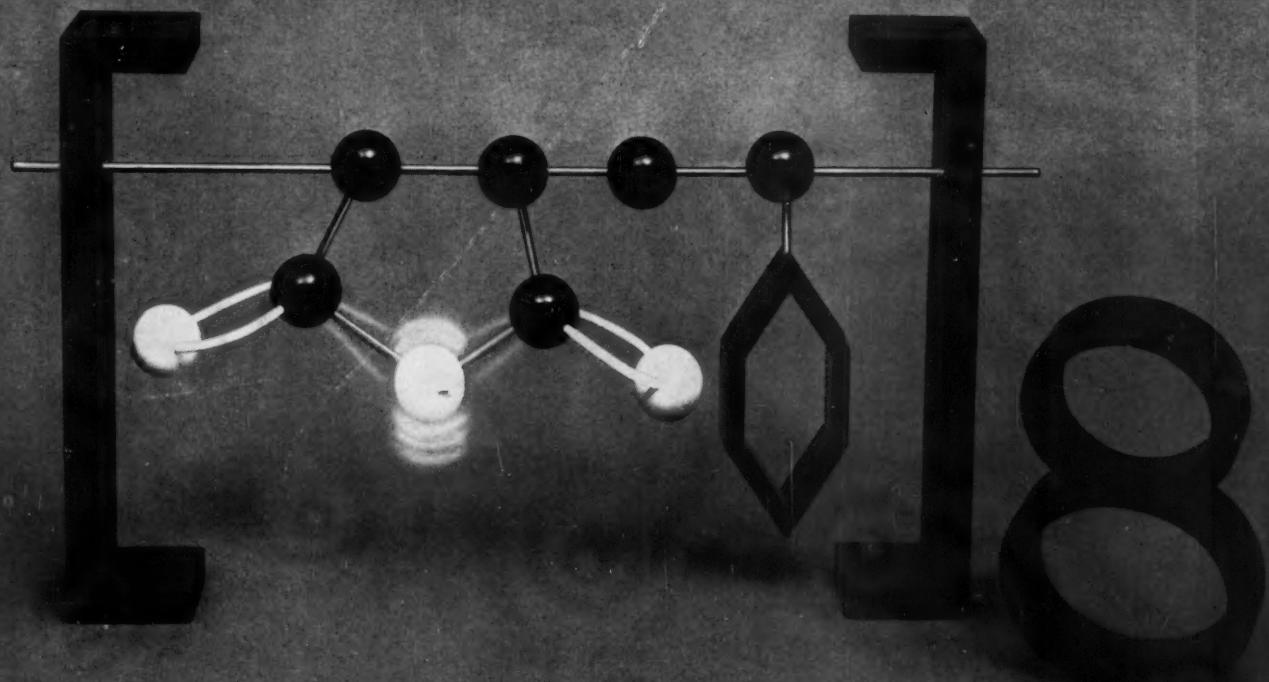
Incidentally, the suit involving Dow's year-round radiator coolant is nearing disposition (*CW Business Newsletter, June 10*).

**New British policy may crimp chemical investment outside the Sterling area.** The policy—part of the austerity program designed to wipe out a balance of payments deficit—states that firms eyeing such areas for expansions won't get Treasury permission unless they show that the investments will help the payments balance within 18 months. That's a shorter period than most foreign investments take to pay out. And the Bank of England is asking British companies operating overseas to send home a bigger slice of their profits.

Investment projects already approved in principle (e.g., ventures planned by ICI, Cortaulds, Fissons, Bowaters Paper) may not be blocked, but could be postponed until the payment balance improves.

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**Sulfur stockpiling: Aiming for price stability all over the world.**

## Sulfur Aims Abroad

The Bureau of Mines has just finished its official report on the sulfur industry for 1960. The score: Frasch production, 4.94 million long tons; recovered sulfur production, 220,000 l.t.; pyrite production, 1 million l.t. (sulfur content, 400,000 l.t.). U.S. total production was slightly more than 6 million l.t. Sales took something less than 5.9 million l.t., reassuringly close to production. What these totals do not show is the all-important growth of international markets.

Principal U.S. producers have about 20% of their sales overseas; for many of the smaller producers, the percentage is much higher. This year's export sales (handled mainly by Sul-exco, Sulphur Export Corp., set up by the four major U.S. producers) will be up about 18% over last year's.

Export sales last year were up a whopping 30% higher than those of the year before. Main reasons for the '59 boom were, aside from Europe's bouncing industrial growth, a tendency to buy ahead and stockpile in anticipation of local shortages.

The export sulfur business is expected to continue growing, with annual increases on the order of 18% for the next ten years. Biggest growth will probably come in the so-called "southern tier," the underdeveloped nations of Africa and Asia, which are just beginning to awaken to fertilizer. Fertilizer manufacture is the biggest single outlet for sulfur.

India should be the first of these countries to heavily boost sulfur consumption. The Indian government feels that it has concentrated too much of its development effort on

steel and other basic industry, to the disadvantage of agriculture. The five-year plan now going into operation puts heavy emphasis on fertilizer plant building.

**Red Prices:** Russia, Poland, and other Communist countries—including, occasionally, Red China—have competed with Western producers in world markets. Usually these countries offer about a 10% price advantage. U.S. sources are uncertain whether the Communists are motivated politically or simply by a desire for needed foreign exchange.

Russia's sulfur reserves are not large, and the Russian threat is not great. The major threat for U.S. sulfur producers is the Canadian stockpile, now building up in Alberta as a by-product of sour-gas processing. This stockpile is not now exceedingly large—374,962 long tons—but when several new producers come into the market next year, production will rise to 1.3 million long tons/year. The sulfur will pile up fast.

Shipping costs are keeping Canadian sulfur off the market at the moment. It costs more to ship sulfur from the remote stockpiles than the sulfur will bring in the marketplace. (Since the producers are making money selling the recovered natural gas, the sulfur can be considered so much gravy—if it can be sold.)

U.S. producers feel that Canadian sulfur will be competing in U.S. markets sometime within the next five years. Many schemes have been propagated to move Canadian sulfur cheaply—including submarines made of the mineral, hot sulfur pipelines, cold sulfur slurry pipelines—but knowledgeable men in the industry are now convinced that it is going to move into the U.S. by train, and that the eventual solution will be a simple matter of adjusting freight rates. Their reasoning: nothing better than rail or ship movement of sulfur has yet been found.

**Price and Profits:** Profit levels are difficult to establish for the industry because Freeport is still writing off its Cuban nickel venture, seized by Castro in '60. Generally, however, the major producers' profits are still higher than 20%. Both Freeport and Texas Gulf averaged 23% for '60.

## Sulfur: U.S. and the World

	'56	'59	'60
<b>U.S. Production</b>	7,818,112	6,167,740	6,660,541
<b>World Production</b>	16,775,000	16,685,000	17,995,000
<b>U.S. Imports</b>	387,429	776,888	884,838
<b>U.S. Exports</b>	1,675,331	1,635,607	1,786,543
<b>U.S. Stockpile</b>	4,055,896	3,949,954	3,777,799
<b>U.S. Consumption</b>	5,744,300	5,917,100	5,859,500

Source: Bureau of Mines (Long tons, sulfur content)

Texas Gulf tallied 20.6% the second quarter of this year (*CW*, July 29, p. 13), down from a second-quarter profit ratio of 21.3% in '60. At the half, Freeport Sulphur's earnings were up 3.4% from the previous year. Texas Gulf Sulphur's earnings were down 1.4%. Earnings of Pan American Sulphur Co., the principal Mexican producer, are down 25.4% to give a profit ratio of 13.2%.

The U.S. sulfur industry is currently operating at about 55% of capacity, has about nine months' production piled up above ground. The price firmed last year, with a two-dollar/ton rise, to \$23.50/ton. Impetus for the hike came from France's Societe Nationale des Petroles d'Aquitaine (Lacq), which found that it could easily dispose of its 1.4-million-tons/year capacity in Europe's fast growing market, and could therefore get the price it wanted for it. Standing firm on a good price is an ingrained French business trait; in this instance the French managed to make it stick, and other producers followed suit.

**Hot Delivery:** In the U.S. market, sulfur virtually must be delivered in a molten state—at least to big customers. The major producers have just completed distribution systems which allow them to deliver molten sulfur to nearly any point in the country. With price competition not now important—Mexican producers are selling at about the same price as everybody else—this sort of service is important.

By getting the sulfur hot, customers can avoid the melting operation, save money in making sulfuric acid or other products. International marketers have not yet adopted this extra. Competition is not a critical factor in these fast-expanding chemical economies.

Producers everywhere feel that their best opportunity lies in increasing the over-all market. To this end, they have formed the Sulphur Institute (Washington, D.C.), primarily engaged in developing new uses for sulfur. Trepidation that the institute—formed last year and including most companies of consequence in the industry—would develop into a cartel, have proved unfounded. Informed sources in the U.S. government now tell *CHEMICAL WEEK* that they are convinced that the Sulphur Institute is just what it says it is—a research and development organization. Most promising fields of development: industrial products, including metals (uranium, titanium) refining, and new products such as a highway-marking paint based on sulfur.

The Institute farms out its research work to laboratories both in the U.S. and abroad, contributes money to company projects. Results are available to members for nominal fees.

Beyond new industrial uses, many sulfur producers are now actively working with the fertilizer industry, particularly in underdeveloped countries. Some have actually loaned money, hoping to get initial projects off the ground and thereby open new markets.

Sulfur producers are not now, by and large, worried. They are enjoying their prosperity, assume business will keep rising. But they could find some worries, aside from Russian or Canadian competition, if they were looking for them. Fertilizers, for example, are tending away from the use of sulfur just now. But people in the field figure that international sulfur consumption will increase just a bit faster than industrial activity—just by the amount that underdeveloped lands are developing agriculturally.

## Gloom in Smog Control

The California Motor Vehicle Pollution Control Board has run into industry objections to its tentative longevity requirements for exhaust-control devices, and a final answer to the problem seems still far off.

At a meeting last month, the board heard Universal Oxidation Process' James O. Britt claim the 12,000-mile life-span was too stringent and would add unduly to the cost of the device. He didn't specify a more reasonable figure, but at least one board member interpreted this to mean 6000-8000 miles.

Britt also recommended that the MVPCB clarify the cost-limitation factor. Present wording says the device should not be "burdensome later." The board has expressed the hope that the installed cost would be kept between \$50 and \$75.

On the other side, Ward Sandford of Minnesota Mining & Manufacturing said the 12,000-mile criterion should not be relaxed. Minnesota hasn't submitted a device for approval, but indicated it has plans to do so.

**More Pessimism:** Another sombre note has been sounded by the chairman of the AMA Engineering Advisory Committee, Ralph H. Isbrandt, who is vice-president automotive engineering, American Motors Corp. He claims "the \$3-million/year auto industry effort to come up with two satisfactory emission control devices for vehicles is not much further ahead than it was a year ago."

One blow was the shelving of the most promising device so far—Ford's low-temperature catalytic converter using vanadium pentoxide pellets. Industry observers feel there was no sound engineering reason for side-tracking it. (California decided to include carbon monoxide as an undesirable element.) It is felt that the decision will be successfully appealed. The Ford device was said to last 25,000 miles and cost \$50 installed.

As of now the Houdry-General Motors dual-bed high-temperature converter is the only one that has been accepted for even preliminary evaluation by California.

Isbrandt wants to make clear to chemical firms that the auto industry is very serious when it guarantees complete proprietary protection for

anyone developing an acceptable device. "A chemical submitted to an auto company as a potential catalyst very definitely will not be analyzed; it just will be tested fairly and impartially," he states.

**Blowby** Devices: Health Education & Welfare Secretary Abraham Ribicoff recently called attention to another type of exhaust control when he threatened to seek legislation making crankcase "blowby" devices mandatory for new cars unless auto manufacturers install them voluntarily in 1964 models. Most manufacturers now install them on cars sold in California.

These devices, costing \$5-10, eliminate pollutants that leak out of the engine crankcase by feeding them back into the intake manifold or air cleaner. Los Angeles has road-tested two such devices for about 2.5 million miles and finds either will eliminate 80% of hydrocarbons from the crankcase; both together are 100% effective. But only 20-40% of pollutants stem from the crankcase; the major part comes from the tailpipe. Complete emission control would require devices of both types.

## Settled Out of Court

Final details were being worked out this week in federal district court at Wilmington, Del., to dismiss Du Pont's three-year-old composition-of-matter patent suit against Phillips Petroleum over the production of high-density linear polyethylene.

The companies say the settlement will involve exchange of patent rights, but no cash. It is understood that the position of Phillips' licensees (Celanese, W. R. Grace, M. W. Kellogg, and Union Carbide) will not be affected.

In June '58 Du Pont sought to prevent Phillips from producing the rigid, high-density plastic, and asked for an unspecified amount of damages for alleged infringement of a patent Du Pont had received in Dec. '57 (CW, July 5, '58, p. 22). Phillips maintained that it did not come under the patent's purview, Phillips claimed to be using a different process.

Federal Judge William Kirkpatrick dismissed the case early this week. Terms of the out-of-court settlement, as is usual in such cases, were not revealed in detail.



Border's Smerchanski: In Canada as here, there's profit back on the farm.

## From Mines to Farms?

Canada's Border Chemical Co. this week is sizing up opportunities in the fertilizer field. The company, now completing a big ore-processing complex in Transcona, Manitoba, already has sulfuric acid units operating that might be used to supply an ammonium sulfate fertilizer plant. The ore facilities won't be ready until an ore roaster—on which bids are now being received—goes onstream. This probably won't be before early '62.

Even when it is working, the ore plant won't use all 27,000 tons/year acid output, part of which is currently going into Border's 6-million-lb./year copper sulfate plant (CW, March 4, p. 60) and its 90-tons/day liquid alum unit (CW, April 8, p. 25). So Border President Mark Smerchanski is now weighing the merits of producing fertilizer for the prairie regions in Canada, where soil-exhausting crops such as sugar beets have become popular.

**Competitive Spot:** Border is in a good position to get into ammonium sulfate production. There is a \$20-ton freight charge on fertilizer shipped from Sherrit-Gordon in Fort Saskatchewan, Alta., and a \$15/ton tab (plus 5% duty and exchange differential) on material coming up from St. Paul, Minn. Border could get ammonia from either of these two sources, add its own low-cost acid and be in a good bargaining position. Smerchanski now is trying to decide whether to make the fertilizer or

merely supply the acid to some other fertilizer producer.

The company started building the Transcona complex somewhat by default. It had originally planned to operate out of a plant at its Cat Lake mine (100 miles northeast of Winnipeg); output was to be a 6% nickel, 9% copper concentrate. A sharp drop in the nickel price made such a plan uneconomical, and Border has been setting up its facilities to calcine the ore concentrate, leach out the copper and ship a 75% iron, 25% nickel product to steel mills in the U.S. and nickel producers in Canada.

Chemical Construction Corp. (New York) installed the acid plant at Transcona last summer. It's designed to work on sulfur dioxide from the roaster, but is currently being run on sulfur from Alberta sour-gas fields.

The copper sulfate operation that's using some of the acid plant output is being run now with metal purchased from Hudson Bay Mining & Smelting (Flin Flon, Manitoba). Standard Chemical, subsidiary of Pittsburgh Plate Glass, handles the distribution of the sulfate.

## OCAW Pushes Merger

The Oil, Chemical & Atomic Workers last week adopted a constitutional amendment aimed at easing the way for the union's proposed merger with the International Chemical Workers Union. OCAW voted to reduce the number of districts it has from 16 to 9, thereby lessening the number of political accommodations necessary for the merger.

A concurrent resolution urged further action for merger with the ICWU and "other unions with similar jurisdiction"—reportedly the rubber and textile workers.

In another move aimed at increased collective bargaining strength, OCAW resolved to try to organize white-collar and technical workers to replace losses in union membership.

Other steps: a vote to seek industry-wide welfare, benefit and pension plans so workers may take benefits with them when they change jobs within the industry; a call for extension of benefits for long-term unemployed, a reservoir of public works projects at all government levels, and reduction of the work week when there is "substantial" unemployment.

# Blow-Up in Brazil

The surprise resignation of Brazil's President Janio Quadros last Friday carried the country to the brink of civil war and added a major factor of instability to the whole Latin American scene.

By Monday, the situation was still shrouded in confusion caused by conflicting statements by key figures in the crisis and press censorship.

Observers see Quadros' resignation—although it was precipitated by a foreign affairs crisis—as basically an internal affair, the spontaneous act of a rash, headstrong personality who had found it increasingly difficult to govern within the confines of Brazil's delicately balanced political and social structure.

Quadros attempted to upset this balance by establishing a highly autocratic executive authority, with a strong hand in the nation's economic and industrial development and a new "independent" foreign policy.

Brazil's strong conservative forces had become increasingly alarmed over Quadros' leftward-swinging foreign policy. The final straw was his decoration last week of Cuba's "Che" Guevara with the nation's highest civilian award. This provoked Governor Carlos Lacerda of Guantabara state, who charged over television that Quadros' administration was trying to set up a Gaullist regime, suspending Congress, and seeking support from the Left if necessary.

The next day Quadros resigned. His precise motive for resigning is unclear; evidently his authority was challenged by the military's refusal to block Lacerda's telecast.

**In the Balance:** At the beginning of this week, it was impossible to see where Brazil was headed. The situation was something like this: Quadros had been elected with massive popular support. In his seven months in office he had set a foreign policy course which, though it alarmed Brazilian conservatives, had left Washington and U.S. businessmen with investments in Brazil relatively unruffled. They were convinced that Quadros was essentially anti-Communist so far as his domestic policies were concerned, and that his economic reforms were good for Brazil.

Now Brazil faces a dangerous prob-

lem of succession. Quadros' legal successor is Vice-President Joao Goulart. Goulart is a radical Leftist, who could be expected to cast aside Quadros' crucial economic stabilization measures and try to carry the country sharply to the left, internally as well as externally.

But powerful opposition is mounted against Goulart in the armed forces and other conservative and moderate circles. At the beginning of the week, Goulart was delaying his return from Europe, while the country was nominally headed by Ranieri Mazzilli, Speaker of the Chamber of Deputies, as interim president. But the real man in command was War Minister Odilio Denys, who was evidently torn between his strong anti-Communist convictions on one hand, and his belief in constitutional procedures on the other.

The danger is that if Goulart is blocked from office, his leftist supporters, backed by some minority military groups, might stage uprisings. Even if a peaceful transition is worked out, Brazil's longer-range prospects of solving its potentially explosive economic problems are darkened. Quadros had been considered one of the few men who might have carried it off.

## Switch in Austria

Hard times and the dim outlook for rayon staple fiber are pushing Austria—one of the major producers of cellulosic fiber—into synthetic production.

Zellwolle Lenzing, one of the staple producers, is now involved in an important change in its manufacturing program. It plans to spend \$15 million over the next three years adding polyacrylic and polyester fiber to its line.

Lenzing's polyester plans are based on Goodyear licenses, while it's going into polyacrylics in cooperation with the state-owned Oesterreichische Stickstoffwerke AG.—Austrian Nitrogen Works. The latter is Austria's biggest chemical producer.

During the first half of this year Lenzing produced 24,000 metric tons of staple fiber, valued at \$12 million, with exports accounting for 67.4% of production.



WIDE WORLD

British Guiana's Jagan is a "Marxist," but sees need for private investment.

## Leftward for Guiana

The election of a leftist regime in British Guiana—South American colony on the threshold of independence—stirred fears last week of a new Communist state rearing up in Latin America. But close observers believe the bark of the nation's new leader—Cheddi Jagan—may prove to be much worse than his bite.

And even Jagan's bark has toned down in the last few years. He is admittedly a Marxist, though the charges that he and his U.S.-born wife are Communists have not been proved. In '53, six months after his party had gained control of the Legislative Council, the British ousted Jagan's government on the grounds that its leaders were trying to set up a Communist state.

British authorities admit they may have been too jumpy, that despite its talk of nationalizing the sugar industry, the government would have settled down to the facts of life. Now that Jagan and his supporters have had even more time to "mature," the British feel, there's even less chance of a really radical swing.

Jagan himself has said he will not expropriate foreign-owned property, which includes Alcoa and Reynolds bauxite mines and Union Carbide's manganese operation.

In the last four years (1957-'60) North American mining companies have invested \$50 million in British Guiana. Reynolds is currently making "substantial capital expenditures."

## national roundup

Rounding out the week's domestic news.

### Companies

**Chas. Pfizer & Co.** (New York) has agreed to acquire, by exchange of stock, Globe Laboratories (Fort Worth, Tex.), a producer of animal vaccines and veterinary pharmaceuticals. The merger, subject to approval of Globe shareholders, will put Pfizer into the field of animal biologicals—"a new direction in the company's research and diversification program."

**Struthers Wells Corp.** (Warren, Pa.) has the approval of its board for a 3-for-1 stock split, subject to stockholder approval (they meet early next month). The company now has 301,904 shares outstanding. The stock split is one phase of the company's plan to boost its research into commercial utilization of the freezing process for conversion of saline water, and to expand its activities abroad.

**Bishop Oil Co.** (San Francisco) shareholders have voted to sell the company's wholly owned Canadian subsidiary to Shell Oil Co. for \$5.6 million. Also Bishop's board voted to distribute the company's holding of 88,136 shares of Flintkote Co. (New York) common at the rate of .19027 share of Flintkote for each share of Bishop stock held.

### Expansion

**Polyvinyl Chloride:** Cary Chemicals Inc. (East Brunswick, N.J.) has awarded a \$4-million contract to Blaw-Knox Co. (Pittsburgh) for construction of a 100-million-lbs./year polyvinyl chloride plant on the Delaware River near Burlington, N.J. (CW, Feb. 11, p. 23). The first of two 50-million-lb. units is scheduled onstream within 9½ months; construction of the second unit will start within 12 months. The company also plans to add another 50-million-lb. polymer plant in the Midwest or Gulf Coast area. Tenneco Chemical Co. will supply vinyl monomer from its Houston Ship Channel plants.

**Antibiotics:** Cyanamid of Canada, wholly owned subsidiary of American Cyanamid (New York), is expanding its facilities for producing antibiotics at its Welland plant at Niagara Falls, Ont. Enlargement, expected to be complete by August '62, will enable the company to produce broad-spectrum antibiotics for human consumption, in addition to the animal grades it now makes.

**Phosphates:** Monsanto's Inorganic Chemicals Divi-

sion (St. Louis) plans to start construction next year at Augusta, Ga., of a plant to manufacture raw materials for the fertilizer, detergent and metal-treating industries. The facilities, due onstream early in '63, will produce phosphoric acid and sodium tripolyphosphate. Cost and capacity figures were not announced.

**Sulfuric Acid:** Swift & Co. (Chicago) is tripling the sulfuric acid capacity of its Agricola, Fla., phosphates center by adding another contact-process unit, due onstream in April '62. The move is part of a two-year, \$30-million expansion of Swift's chemical operations.

## foreign roundup

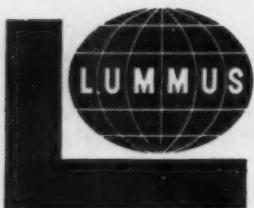
Rounding out the week's international news.

**Fertilizer/Syria:** Russia will build a \$28-million, 110,000-ton/year ammonium nitrate fertilizer plant at Homs, Syria, ultimately cutting imports by \$5.6 million/year. First stage—60,000 tons capacity—is due onstream by '65, the rest in '68.

**Polyethylene/Japan:** The Japan Polyethylene Products Assn. forecasts production of Japanese polyethylene products will rise sixfold between '61 and '70, to a total of 720,000 tons—433,500 tons of high-pressure material, and 286,500 tons of low-pressure. Exports are expected to rise from 2% of fiscal '61 production to 5% of the '70 total.

**Paint/Britain:** International Paints (Holdings) Ltd. and British Paints (Holdings) Ltd. plan to merge via a new holding company in which stockholders will be offered shares on about a 50-50 basis. Assets of each company are about \$29.6 million. They would continue to operate under their present names. International has a strong stake in Europe, while British Paints has plants in many Commonwealth countries, and three in the U.S. The plan is the latest of a series of British paint industry mergers. Three of the four largest producers are now owned by ICI, Courtaulds, and The Wall Paper Manufacturers Ltd.

**Sales/Britain:** Albright & Wilson reports half-year profits slipped from \$12.37 million in the '60 period to \$12.20 million this year. But net profits—after depreciation, loan interest and estimated taxes are taken out—showed a slight improvement; they rose from \$4.17 million to \$4.26 million. Main reason for the profit slip is higher materials and labor costs, the company says. It expects second half gross profits to be lower, due to the full effect of the profit cost-price squeeze and higher depreciation on new plants coming onstream at mid-year.



ENGINEERS AND CONSTRUCTORS FOR INDUSTRY

# Saline Water Conversion Moves a Major Step Closer to Large-Scale Operation

## Department of The Interior Selects Lummus to Evaluate Freezing Processes and Design Demonstration Plant

The Lummus Company has been selected as the architect-engineer for the East Coast saline water conversion plant which is to be erected at Wrightsville Beach, North Carolina, Secretary of the Interior Stewart L. Udall announced recently. The Wrightsville plant is the fifth in a series of five plants authorized in 1958 by Congress to demonstrate the engineering, reliability, and economic potentials of the most promising conversion processes in existence today.

The contract awarded to Lummus calls for an evaluation of the *freezing* processes of saline water conversion. (Of the other plants in the series, three will use various distillation processes and one an electrodialysis process.)

The initial activity of Lummus' contract will require preliminary engineering service to prepare estimated plant costs, layouts, and reports. A second phase will include the design of the plant to permit issuance of specifications for the construction of the demonstration

plant as well as consultation with the Office of Saline Water on matters relative to awarding a construction contract for the plant.

Lummus was chosen from a group of 35 engineering firms considered for the assignment on the basis of its experience in such parallel fields of technology as refrigeration, heat transfer and crystallization. "Product" from the plant will be water of a quality suitable for municipal, industrial or other beneficial consumption. Production rate will be 250,000 gallons per day.

Over 900 plants have been designed, engineered and constructed by Lummus for the process industry throughout the world in the last fifty years. Why not discuss your next project with a Lummus representative?

**THE LUMMUS COMPANY**, 385 Madison Avenue, New York 17, New York, Newark, Houston, Washington, D. C., Montreal, London, Paris, The Hague, Madrid; Engineering Development Center: Newark, New Jersey.

# Washington Newsletter

CHEMICAL WEEK  
September 2, 1961

## The news on beryllium is both good and bad.

On the plus side, Defense Dept. metallurgists—working with Franklin Institute in Philadelphia—report they've taken a major step in zone refining—construction of ductile polycrystalline sheets of beryllium. The goal: to develop sheets that will work structurally as shielding material in rockets and supersonic planes.

Atomic Energy Commission plans to investigate zone refining for beryllium to be used in nuclear work. This project will be undertaken by Nuclear Metals Inc. (Boston).

On the minus side, beryllium is in excess supply. Production was cranked up faster than practical uses could be found—so much so that leading producers are working at anywhere from 20-50% of capacity. The cutback in the B-70 bomber program hurt. Beryllium as component in a solid rocket fuel "is still a laboratory curiosity."

Meanwhile Brush Beryllium Co. (Cleveland) last week posted price reductions of 10% on pure beryllium rod (ranging from  $\frac{1}{4}$  to six in. in diameter).

Beryllium producers want the government to enlarge stockpiles. But there is enough on hand. If any move is made in this direction, it will be on a small scale and mostly for political purposes.

A technical analysis of beryllium ores in Utah and Nevada is due out this fall. Claims and reports notwithstanding, government metallurgists maintain that to date no one has found any practical, economic method for refining beryllium from Utah-Nevada ores. Says one: beryllium imported from South America, Africa and Asia will be the major source of supply for "as long as we can see into the future."

Official policy on trade with Soviet-bloc countries has not changed. But Commerce Dept. officials in charge of issuing such licenses are beginning to take much longer periods of time for consideration of applications. This "pocket veto" technique is part of the "war of nerves" being carried on by both sides in the Berlin crisis.

Prior to the Berlin flareup, there was a slight increase in the trickle of goods being exported to the Communist Bloc—none of which, of course, helped Khrushchev in his military buildup. Now, however, Commerce is turning down about half the applications received and is delaying many others.

Approvals cover a wide variety of products—foods, forest products, chemicals, drugs, plastics, industrial equipment, man-made fibers, and so on. One of the largest approvals during the first half of this year was \$4.9 million worth of chemicals and plastics including \$2.4 million worth of synthetic rubber.

# Washington Newsletter

(Continued)

**The Justice Dept. has not changed its tune on Du Pont.** In a rather vague presentation to the House Ways & Means Committee last week, Justice said in effect: We still feel that the Treasury should not lose money through an antitrust case. But if Congress wants to relieve the tax burden on Du Pont stockholders through their court-ordered divestiture of General Motors stock, it should be done through a private bill, not a general law that would apply to other cases.

Most committee members came away feeling that this was a recommendation against passage of any relief legislation. Others were not so sure. In any case, Congress is so close to adjournment that there is virtually no chance of enactment this year—even if Ways & Means should decide to approve a bill. It will consider the proposals on Aug. 31.

**A new desk-sized information retrieval system** has been developed by Information for Industry, Inc. (Washington, D.C.). Many company executives long have felt the need for such a system, designed primarily for average-sized firms that don't require huge retrieval facilities. The new unit will store about 500,000 microfilm pages of data on a single scroll. Any item on the scroll can be retrieved in an average of 20 seconds. Market price for the basic system will run about \$15,000—but up to \$300,000 for fully automated, high-capacity units.

**A House-Senate battle is shaping up over saline-water programs.** The Senate Interior Committee last week restored most of President Kennedy's building plan that had been rejected by the House. Senate approval is all but certain, which will lead to a bitter fight when the issue gets to conference committee. A sizable amount of money is at stake.

Focal point of the controversy is the President's request for a demonstration plant building program with an unlimited budget. The Senate committee went along with this. The House not only dropped the demonstration plant program but verbally hammered the unlimited budget principle to death.

The Office of Saline Water already has drawn up plans for 13 new demonstration facilities to be built in the next four years—at an estimated cost of \$83 million. This program probably will be cut somewhat by a compromise bill.

**The inventory outlook has brightened considerably,** says the Commerce Dept. A new survey finds that U.S. manufacturers plan to increase their inventories by about \$1 billion in the current quarter—some two-thirds of the total is durables and the rest is nondurables. The reason is easy to find: manufacturers expect sales to be up at least 4% in the fourth quarter.

Economists feel that this is the economic switch (from inventory cutting or, at best, holding the line) that has real meaning. The effect on the economy is expected to be widespread and maintained, with a resulting upsurge through Fall and Winter in most other business indicators.

# AMSCO

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AMERICAN MINERAL SPIRITS CO.  
A DIVISION OF THE PURE OIL COMPANY

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES



When a company is overly pleased with its no-strike record, it may make too many costly concessions.

## New Labor

In hard-fought negotiations this week, a major U.S. chemical producer is laying its seven-year, no-strike record on the line. It has, it believes, a liberal contract now. And like many other chemical companies queried by *Chemical Week*, it has become disillusioned with the idea that labor peace is worth "any price."

Whether labor and management—both bruised by the economic slip of a few months ago— are really in a position to battle over new contracts is still hard to tell. But management, *CW*'s study shows, is convinced that unions aren't in the best position to weather a costly strike. Further, it feels that it has done well by CPI workers.

The company referred to above, for example, has a contract that most unions and management men would agree is liberal. Its provisions include:

- An average hourly wage of \$2.90; maximum basic wage of \$3.015.
- A pension plan that provides for 40% (including Social Security) of average annual earnings based on five of the employee's highest paid ten years. Twenty-five year employees get extra benefits.
- Hospitalization covers the employee, his wife and all dependents under 18. The company pays 78.5% of its cost.
- Each employee is covered by a company-paid \$2,000 life insurance policy and can get another \$3,000 coverage by paying \$1.75/month (the company pays \$1.295/month). The company provides free sickness and accident insurance.
- Vacations are provided for on an ascending scale. One year of service entitles an employee to one week of vacation with 40 hours pay. After two to five years, an employee is entitled to one week off and 66 hours pay. For over 25 years of service, an employee receives 176 hours of pay and three weeks off, has option of additional week leave of absence.
- If an employee is required to work on one of the seven paid holidays, he receives 2.5 times his regular rate of pay.

# Agreements: 'License' or Contract?

• Other benefits include pay for jury service; overtime lunch pay; free tuition, etc.

**Time to Talk Tough:** But, as this company has found out, liberal wage and benefit packages aren't necessarily the answer to labor problems — although they're undoubtedly the most popular solution with employees.

One union official readily admits that a company paying as well or better than its competitors, and covetous of its no-strike record, can be particularly vulnerable to union demands. A firm management stand is needed against exorbitant demands, he admits.

One CPI vice-president tells *CW* he thinks chemical companies have actually coddled unions. He believes that an occasional long strike is inevitable if management is vigorously guarding its prerogatives.

"Absence of an occasional strike means that management is bending over backwards to avoid one and is giving too many concessions. Labor peace at any price is expensive. Wages and benefits to workers are excessive; management misses opportunities to make improvements because of possible labor difficulties; and higher costs occasioned by union victories can force management into nerve-wracking efficiency drives."

**Strike Kitty:** Strikes, moreover, are still a key weapon in union arsenals. Many unions have been trying to build up a substantial war chest of funds to see strikers through these pitched battles.

The National Industrial Conference Board (New York) in a new report, points out that 57 of 102 national and international unions have strike benefit plans. These unions have a total declared membership of 8.9 million vs. 13.9 million for all unions surveyed.

**Checkoff:** The International Chemical Workers, for example, earmarks 25¢ of each member's monthly dues for the strike fund, pays \$10/week to the striking local for each member. Benefits begin the third week of the strike. After the eighth week, or when the strike fund falls below \$200,000, benefits are paid to locals

"according to need." Oil, Chemical and Atomic Workers' benefits average \$10/week.

Chemical unions are not the most munificent, according to NICB. But neither are they at the bottom of the scale in financial assistance provided striking members. Stipulations and qualifications for receiving benefits, waiting periods and the duration of benefits also vary widely among the nation's unions.

NICB says union members are beginning to think of strike benefits as a right rather than a need, with the latter's connotation of charity. They also point out that although all union members benefit in pattern-setting, strike-ending agreements, only a few strikers bear the cost.

What the NICB report doesn't show, however, is that chemical union membership is dropping, and that the amount of money in the strike funds may not be as great as it once was. And this, some union officials feel, may seriously limit their ability to strike successfully.

Unions are also convinced that management uses long strikes as a weapon. They point out that workers have little hope of gaining enough from wage increases or other benefits to match (within a year) the wage losses resulting from a strike that lasts longer than eight weeks.

And there is no question that under pressure of a prolonged strike, management has often come up with process improvements or production changes that eventually trim manpower requirements. On the other hand, company earnings are hurt by strike-caused emergency shutdowns, loss of production, and subsequent start-up.

**Middle Roaders:** When unions and management start stockpiling money — or inventory — labor negotiations take on the aspect of an arms race. And some companies, such as Dow Chemical, American Viscose, and Olin abjure this situation.

Dow Chemical, which built or helped build hospitals, schools and a library at Midland, Mich., where it maintains headquarters, offers wages and fringe benefits that are as high

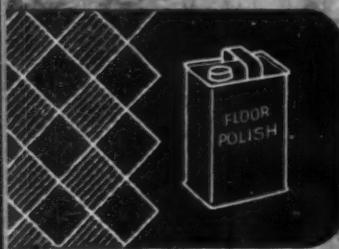
or higher than those of other industries in the area plus a stock purchase plan in which 48% of its employees participate.

"None of these benefits would stop a strike," according to a Dow spokesman. "Strikes are the result of attitude. We meet with union leaders quarterly and tell them the state of the business. We also have a weekly meeting with the union (Local 12975, District 50, United Mine Workers) committee." With 6,000 employees in the bargaining unit, only about 50 grievances a year reach the committee meeting level. About 625 grievances are ironed out annually by department heads, shop stewards, and supervisors. Only five grievances have reached the National Labor Relations Board since '41.

**Friendly, Firm, Factual:** American Viscose Corp. — with seven plants located in Pennsylvania, West Virginia, and Virginia — has not had a strike in the 25 years it has been union organized. George Horst, the firm's director of personnel and industrial relations, who has headed Viscose's labor (Textile Workers of America, AFL-CIO)-management dealings since '46, shuns words such as "prerogatives," "rights," and "I contend" in labor dealings, prefers "we believe" or "we think" as suggesting mutual consideration.

The labor peace formula offered by Olin's Chemical Division (Baltimore) — which deals with 12 unions (including OCAW, ICWU, District 50, the Teamsters, etc.) and holds 28 labor agreements — is "be factual, fair, firm and friendly." The division hasn't had a strike in more than a decade.

**Things To Come:** As OCAW opened its Chicago biennial convention last week, President O. A. Knight remarked "We know that we don't win whopping big wage increases and major contract changes in many cases these days." But discussion was expected on a proposal to raise minimum monthly dues from \$3 to \$5 as part of Knight's campaign to "increase job security for members." Labor bargaining, it appears, will get tougher in the chemical business.



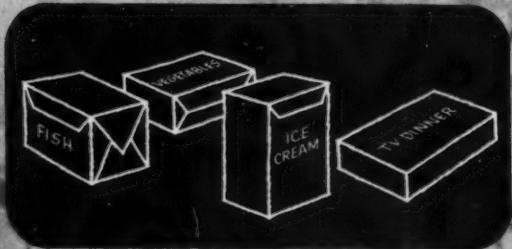
#### Floor Polishes

As the wax component in floor polishes containing acrylic and styrene polymers and copolymers, Epolene resins provide maximum toughness and durability along with a natural slip resistance. Stable and low in color, Epolene pastes and emulsions are economical and easy to prepare.



#### Paraffin Modification

As little as 2% of an Epolene resin adds significantly to the adhesive properties and tensile strength of paraffin coatings, thus reducing the tendency of such coatings to crack and flake.



#### Carton Coatings

Special cuts of paraffin blended with 20 to 40% Epolene resins provide high-gloss carton coatings of particular interest to packagers of frozen foods. Resistant to grease and moisture, the coatings can be formulated to withstand low temperatures without cracking, flaking, or hazing.

# Epolene<sup>®</sup> POLYOLEFIN RESINS

Low-molecular-weight polymers that  
improve a wide variety of  
industrial products and processes

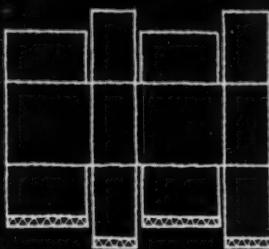
Epolene polyolefin resins are chemical polymers whose physical properties are intermediate between those of paraffins and plastic-grade polyolefins. Their molecular weights range from 1500 to 10,000. Like waxes, Epolene resins can be melted and blended with many natural and synthetic materials, paraffins, and other resins. Yet, the physical properties of Epolene resins are superior to most waxes—they are tough, flexible, and chemically inert.

Epolene resins, singly or in combinations, contribute to improved performance in decorative moisture- and grease-resistant coatings for a variety of paper and paperboard products. They provide maximum toughness and durability in floor polish formulations. Hot-melt adhesive and laminating formulations based on Epolene resins provide strong, quick-setting bonds between such diverse materials as aluminum foil; all types of paper; and cellul-

lose acetate, polyethylene, and polyester films. In textile emulsion finishes, Epolene resins improve the tear resistance, hand, and abrasion resistance of fabrics.

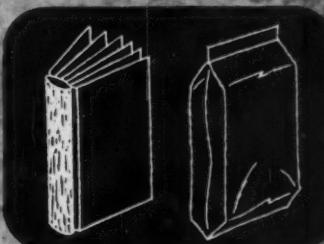
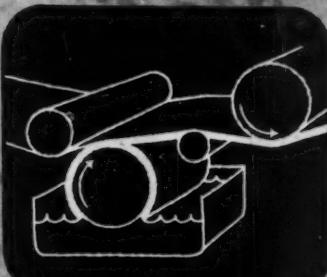
In these applications and in many other industrial processes and products, Epolene resins provide the means for improved performance and usefulness.

As indicated in the Tables, the basic types of Epolene resins vary in characteristics as their molecular weights or densities approach those of paraffin or a plastic-grade material. Some idea may be obtained from these Tables as to which Epolene resin will prove most suitable for your particular product or process. For more detailed information, and for technical assistance in selecting and using Epolene polyolefin resins, write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.



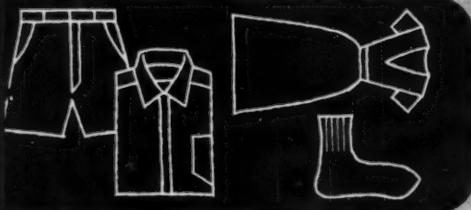
### Corrugated Board Coatings

Hot-melt Epolene coatings specifically developed for use in high-speed curtain coating machines provide web or die-cut paperboard with a barrier against moisture and grease, and are highly resistant to abrasion. These clear, high-gloss coatings give a smooth, attractive finish that can be applied economically.



### Hot-melt Adhesives

Economical hot-melt adhesives are formulated with Epolene resins for a wide variety of high-speed packaging and sealing operations. Applications include bookbinding, labels, and lamination of foil, paper, and plastic film.



### Textile Finishes

Used primarily to improve the hand and drape of resin-treated, wash-and-wear fabrics, Epolene emulsion softeners also significantly improve the tear strength and abrasion resistance of the fabric.

### Paper Coatings

Hot-melt Epolene coatings applied by roll coating techniques on foil, parchment, kraft, glassine, chipboard, and most other paper stocks give these packaging materials an attractive gloss plus a high degree of moisture resistance and grease resistance. Such coatings can be formulated to make them readily heat sealable.

POTTING COILS AND CONDENSERS • CARBON PAPER  
COTTON DUCK COATING • COATED PAPER FOR FIBER DRUMS  
FOR COATING GLASS BOTTLES • LEATHER FINISHES  
PAINT AND VARNISH • PRINTING INKS  
EMULSION PAPER COATINGS • RUBBER COMPOUNDING  
SLUSH MOULDING • AGRICULTURAL SPRAYS

### Other Applications

There are many other applications for Epolene resins. Some are still under development, others are being tested and evaluated in processes and products. Please write for specific information in the area in which you are especially interested.

### Emulsifiable Epolene Resins

◀ wax-like properties ▶ plastic-like properties ▶

Effect of Molecular Weight on Viscosity				
TYPE	E-14	E-11	E-12	E-10
Molecular Weight	1400	1500	1500	2500
Viscosity at 125°C., cps. (Brookfield)	300	375	410	2000

Effect of Density on Hardness and Tensile Strength

TYPE	E-14	E-11	E-10	E-12
Density	0.935	0.938	0.940	0.950
Penetration Hardness (100g./5 sec./77°F.)	3.5	2.5	2.0	1.5
Tensile Strength, psi	430	510	1300 <sup>a</sup>	530

### Non-Emulsifiable Epolene Resins

◀ wax-like properties ▶ plastic-like properties ▶

Effect of Molecular Weight on Viscosity								
TYPE	130° AMP PARAFFIN	N-12	N-11	N-10	C-12	C-10	C-11	TENITE 810 <sup>b</sup>
Molecular Weight	325	1500	1500	2500	3700	7000	10,000	38,000
Viscosity at 125°C., cps. (Brookfield)	3	364	390	1990	900 <sup>c</sup>	14,300	>25,000	>100,000

Effect of Density on Hardness and Tensile Strength

TYPE	130° AMP PARAFFIN	C-12	C-10	N-11	N-10	N-12	C-11	TENITE 3300 <sup>d</sup>
Density	0.850	0.897	0.906	0.925	0.927	0.937	0.947	0.960
Penetration Hardness (100g./5 sec./77°F.)	15	11.5	2.5	2.0	1.5	1.5	<1	<1
Tensile Strength, psi	180	200	730	550	920	brittle <sup>e</sup>	1700	4000

a. Tensile strength is higher than density alone would indicate because of a higher molecular weight. b. An Eastman plastic-grade polyethylene. c. Chain-branching in this polymer reduces viscosity below that of more linear polymers, even at higher molecular weight. d. An Eastman high-density plastic-grade polyethylene. e. Too brittle to prepare film.

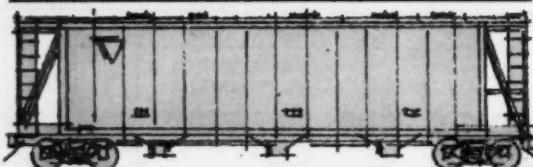
**SALES OFFICES:** Eastman Chemical Products, Inc., Kingsport, Tennessee; Atlanta; Boston; Buffalo; Chicago; Cincinnati; Cleveland; Detroit; Greensboro, North Carolina; Houston; Kansas City, Missouri; New York City; Philadelphia; St. Louis. **Western Sales Representative:** Wilson & Geo. Meyer & Company, San Francisco; Los Angeles; Salt Lake City; Seattle.

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# 18

## MAJOR CHEMICAL COMPANIES

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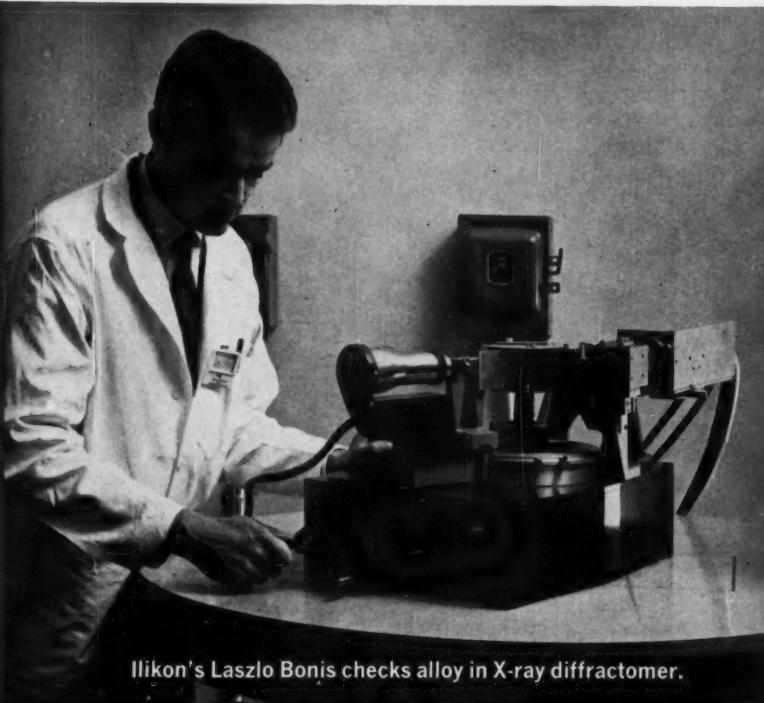
patented nozzle for pneumatic unloading.

The DRY-FLO CHEM car is built with three separate compartments, each with its own nozzles and hatches. Exterior carlines—pioneered by General American—provide a smooth unbroken ceiling surface and hopper corners rounded on a 2½" radius minimize product retention inside the car.

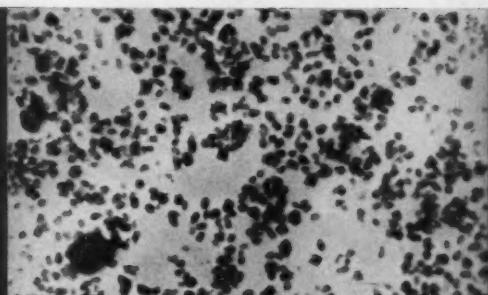
Write for details.

## RESEARCH

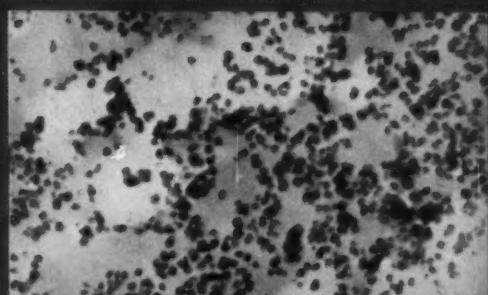
### X-ray studies, electron micrographs prove stability of new alloy



Ilikon's Laszlo Bonis checks alloy in X-ray diffractometer.



Grain structure before heat treatment...



...shows no change after 6 hours at 2,100 F.

## Particles Point Way to Tougher Alloys

A new approach to making high-temperature alloys may point the way to better metals for such demanding applications as supersonic aircraft, missiles and reactor vessels. Said to combine the strength of precipitation-hardened superalloys and the high-temperature stability of sintered aluminum powder-type (SAP) alloys, the new materials are called STAP (for stabilized precipitate) by their developer, Ilikon Corp. (Natick, Mass.).

Ilikon's research has been aimed at maintaining a metal's strength at temperatures approaching its melting point — most conventional metals weaken drastically at temperatures well below their melting points. By narrowing the gap between melting point and strength-loss temperature, Ilikon may be able to point the way to metals with the high strength qualities needed for the Mach 3 transport plane demanded last month by three government agencies.

Indicative of how far the company

has progressed in its search are preliminary tests on a four-component, nickel-base STAP alloy. According to Ilikon's Executive Vice-President and Technical Director Laszlo Bonis, this material shows none of the changes in grain structure associated with strength loss at temperatures up to 2100 F (nickel melts at 2650 F). Tests on extrusions of the treated alloy have started and larger-scale evaluations will be carried out in coming months. Meanwhile, Ilikon has applied for patent coverage of its new material.

Though still in the early stages of development, the stabilized precipitate technique may well be applicable to alloys based on practically any structural metal, says Ilikon. And cost of the materials so made is predicted to be at the same level as others produced by powder metallurgy.

**Dislocation Blockers:** Secret of the improved strength of materials made by precipitation hardening, SAP or

STAP, is the presence of tiny (Angstrom-range) particles of one of the alloying elements or of other materials. These extremely small particles, when evenly distributed, block "dislocation" in the metallic structure and thus strengthen the alloy.

Precipitation hardening is one way to get the needed particles. In this method, an alloy composition is chosen for two properties: stability at elevated temperature; ability to precipitate one or more of its constituents as a "second phase" when cooled to room temperature. Properly controlled, the second-phase particles are small and evenly distributed. When the metal is heated, however, the second phase gradually becomes more soluble in the base metal, and the strength imparted by dislocation-blocking particles vanishes as the precipitate is redissolved.

To avoid this "disappearing particle" problem at high temperatures, the sintered aluminum powder tech-

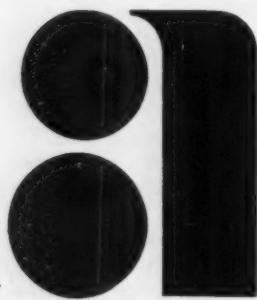
# custom methylation service



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#### PROPERTY DATA

CHEMICAL FORMULA...  $\text{CH}_3\text{Cl}$   
MOLECULAR WEIGHT... 50.491  
SPECIFIC GRAVITY  
Liquid... 23.7°C/4°... 1.00  
20°C/4°... .98  
Gas 0°C, 1 atm... 1.74  
BOILING POINT °C, 760 mm... -23.76  
°F, 760 mm... -10.76  
REFRACTIVE INDEX,  $n$  20°C/D  
Liquid... 23.7°C... 1.3712  
Gas... 29°C... 1.000703  
SOLUBILITY (in cc.) of Methyl Chloride Gas  
In 100 cc. of solvent (20°C, 760 mm)  
Water... 303  
Benzene... 4723  
Carbon Tetrachloride... 3756  
Glacial Acetic Acid... 3679  
Ethanol... 3740



ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN • INDUSTRIAL CHEMICALS • REFRIGERATION PRODUCTS • FIRE FIGHTING EQUIPMENT

## RESEARCH

nique was developed. In this method finely ground aluminum particles (oxidized to alumina by the air) are mixed with the alloying metal powders, which are then sintered. In the resulting alloy the alumina particles provide the strength at elevated temperatures. However, the hardening effect is not as pronounced as in the precipitation method because the alumina particles are not nearly as finely distributed.

**Internal Oxidation:** Attempts to form oxide particles within alloys by means of internal oxidation date back to the '40s. But the technique could only be used on thin films or wires of the metal, thus limiting its usefulness. However, in the mid-'50s, Professor Nicholas Grant of Massachusetts Institute of Technology worked out a method of applying internal oxidation to coarse alloy powders, which could then be shaped by powder metallurgy techniques.

Researchers at General Electric, Westinghouse and a number of other laboratories are understood to be working on internal oxidation techniques. And New England Materials Laboratory (Medford, Mass.), a firm headed by Grant, has a Navy contract for research on application of the method to molybdenum alloys. NEML Research Director Klaus Zwilsky tells CHEMICAL WEEK that the stress-to-rupture (for 100 hours at 1800 F) of molybdenum-titanium alloys is significantly increased by the technique. One problem: avoiding oxidation of the molybdenum while the titanium is being oxidized. Previous work with molybdenum-columbium alloys gave oxide particles too large to be effective hardeners.

**Dispersion Control:** A similar problem was found by Bonis while working on internal oxidation of two-element nickel- and copper-base alloys at MIT. His solution: form a multi-element alloy that precipitates two or more elements in a strict stoichiometric ratio. Since the particles can grow only when the exact proportions of elements are present, there is more opportunity for new particles to be formed. Thus, particle size is kept small and distribution is relatively even.

Until patents issue, Bonis won't disclose the exact nature of the second phase, but the elements in the experimental alloy are nickel, chromium,

titanium and aluminum. After a solid solution of the elements is formed, the alloy is pulverized and held at the temperature at which precipitation of the second phase can take place. A given amount of oxygen is introduced at the proper moment. (The whole process, including precipitation and oxidation, is governed by relative rates of reaction and is therefore controlled by time.) The oxide layer (probably titanium or aluminum oxide) formed on the dispersed particles within the alloy is only a molecule thick, but is sufficient to prevent the particles from dissolving upon heating of the alloy.

A bonus found in the nickel alloy is its thin, oxidation-resistant surface coating. Analysis of the coating showed it to be  $\text{NiAl}_2\text{O}_4$ , an oxygen-filled spinel crystal structure. Bonis says that the alloy could be designed for maximum oxidation resistance or for maximum strength, with some sacrifice in the other property.

Materials users are sure to show keen interest in results of scaled-up tests of the new stabilized precipitate alloy, and in any further evidence that the technique is applicable to other metallic systems.

## EXPANSION

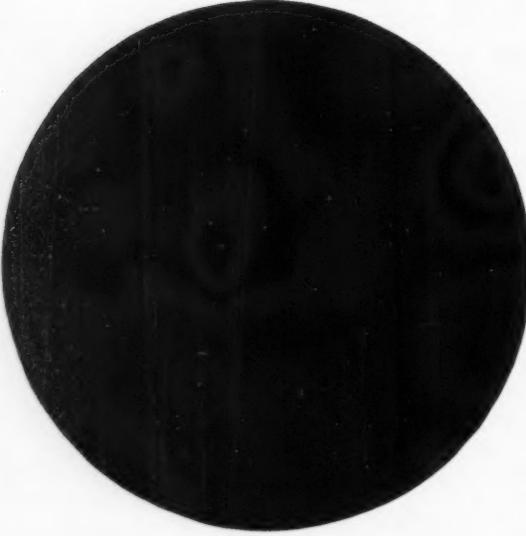
• Union Carbide Chemicals Co. has set up a new research and development department at its South Charleston, W. Va., technical center to integrate product, application and process research in three areas. Newly named R&D directors are Franklin Johnston, special projects; John Bidle, polymer chemistry; and Benjamin Phillips, organic chemistry.

• Corning Glass Works will open a new process research center in Painted Post, N.Y. The 93,500-sq.-ft. building will triple the company's experimental melting and processing operations.

• Mine Safety Appliances Co. (Pittsburgh) is consolidating all its research activities, including those of subsidiary MSA Research Corp., into a new corporate research and engineering division. Roger Mather is director of the new division. Associate directors are J. V. Mausteller, research; R. C. Werner, engineering and development; and J. P. Strange, product engineering. D. N. Wise is manager of administrative services.



**This  
is  
the  
new  
shape  
of  
steel  
pails**



# This is the new U.S. Steel nesting pail... the Taper-ite

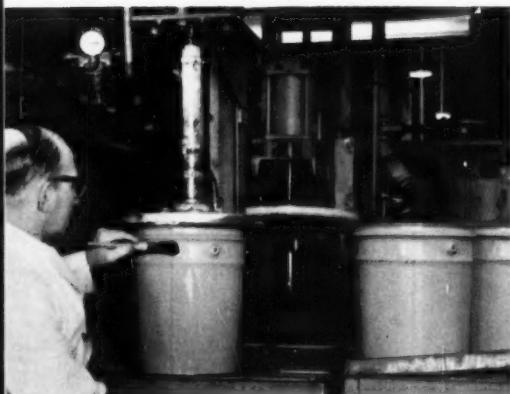
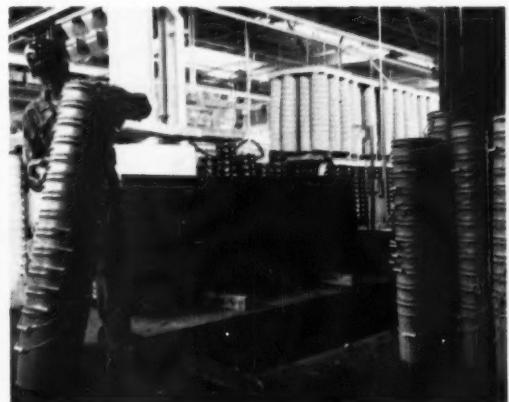


The U. S. Steel Taperite is the finest pail to ever hit the packaging field. Look at its design. Notice there is a top swedge in addition to a bead. This makes the Taperite pail stronger. And the lower bead is the only contact point when the pails are nested. The single side seam is welded and each pail is air tested for tightness. □ Notice the embossed design of the Taperite cover. When filled pails are stacked and rolled — the embossment makes a tight and secure fit. And the cover is standard size, so regular closing tools can be used. □ Taperite pails offer real economy too—they save storage space and expensive handling time. What could be more practical? □ For further information and samples of the Taperite pail, wire, write or call your nearest U. S. Steel Products Division representative.



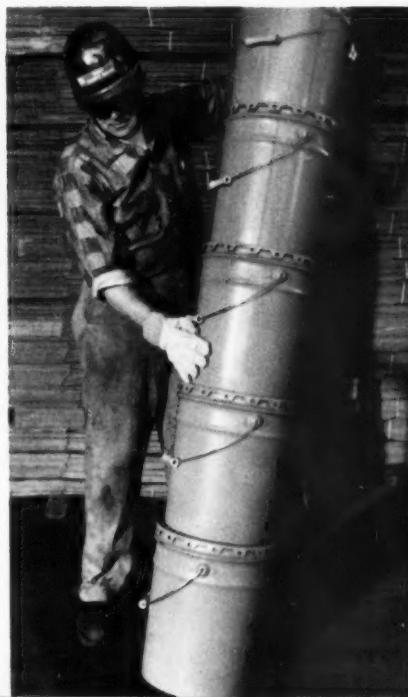
Saves 66% storage space: Taperite's nesting feature saves you  $\frac{2}{3}$  the space needed for conventional pails.

**Below—Cuts handling costs:** Unloading and handling time are cut down because more pails can be handled at the same time. Cuts the hazard of stacks falling during shipment.



**Quality tested:** Each Taperite pail is air-tested for tightness and visually inspected before we ship it. Taperite pails are also subjected to drop tests, hydrostatic tests and vacuum tests on a periodic basis.

**Right—Easy stacking:** The double seamed bottom fits the special debossment in the cover permitting easy stacking and handling when the pails are filled.



**Regular equipment can be used:** The top of the Taperite pail is the same size as a standard pail so Taperite's lug covers can be closed with regular closing equipment.





# Taper-ite Pail Specifications

These specifications conform  
with ICC requirements

	5	6	6 1/2
	24 26 28 29	24 26 28 29	24 26 28 29
	5.3 4.0 3.3 3.0	5.9 4.4 3.7 3.3	6.2 4.7 3.9 3.5
	13 7/8	16 5/16	17 17/32
	13 31/32	16 13/32	17 5/8
	12 1/16	12 1/16	12 1/16
	11 1/4	11 1/4	11 1/4
	10 7/16	10 7/16	10 7/16

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**U. S. Steel Products**  
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TRADEMARK

## SPECIALTIES

# Fluorides: Favored by Fiat

**Sales soared when P&G's fluoride-containing toothpaste gained ADA endorsement. Other makers, impressed by P&G's success, are hopping on fluoride bandwagon.**

The magic ingredient in toothpaste selling seems to be ADA — the American Dental Association. Since that group gave its approval just a year ago this month to Procter and Gamble's stannous fluoride-containing Crest Toothpaste, sales of that product have reportedly more than doubled, putting it just a short distance behind Colgate-Palmolive's dental cream as the country's top-selling\* brand of toothpaste.

Procter and Gamble's success with ADA-approved Crest has prompted other toothpaste makers to bring out competing products incorporating fluorides in one form or other.

Colgate-Palmolive is now test marketing in the Texas-Louisiana area a new stannous fluoride-containing toothpaste called Cue. And Bristol-Meyers, the number-four seller of toothpastes in the U.S. has changed the formula of its Ipana to include sodium fluoride along with hexachlorophene.

There is trade talk, too, that P&G is seriously considering putting stannous fluoride into its Gleem, the third most popular toothpaste in the U.S. If so, three of the country's top five toothpaste brands (which account for over 90% of the \$235 million retail market) would then contain some form of fluoride as a therapeutic agent.

**New Wine, Old Bottle:** When Crest first received recognition from ADA's Council on Dental Therapeutics as an effective anticaries dentifrice, P&G reacted quietly. It appeared that P&G wouldn't attempt to turn the ADA approval into a hard-sell campaign. Since then, however, P&G has used full-page ads to make the public fully aware of ADA's action. By invoking the prestigious ADA name, P&G has not only made competing toothpaste makers gnash

\* Advertising Age lists the toothpaste market this way — top seller is Colgate Dental Cream with 27% of the market; next is P&G's Crest with 25.9%, followed by P&G's Gleem (20%), Lever's Pepsodent (10%), Bristol-Meyers' Ipana (6%) and Lever's Stripe (5%).

their teeth, but has caused dissension within ADA. Some members of that group feel that ADA should not concern itself with endorsement of a product.

**Aging New Wonder:** That ADA was largely responsible for the success of P&G's Crest seems incontrovertible in light of the fact that the toothpaste contained stannous fluoride almost five years before ADA approval came and during that time P&G was not able to make much headway against the top-selling "invisibly shielded" Colgate, or even against its own "no-cavity" Gleem. P&G wasn't the only one to sound the praises of fluoride. In the mid-'50s Colgate (with Brisk) and Bristol-Meyers (with Sentry) had sodium fluoride containing toothpastes on the market. Neither was particularly successful.

The breakthrough for fluorides came after revelation of the results of P&G-sponsored tests at the Indiana University School of Dentistry in a project headed by Dr. Joseph Muhler. Formulation of Crest at the time of ADA approval was stannous fluoride, 0.4%; calcium pyrophosphate, 39%; glycerin, 30%; stannous pyrophosphate, 1.0%; water 24.97% and miscellaneous agents, 4.63%. The use of calcium pyrophosphate was the key to the successful formulation. Other polishing agents (such as dicalcium phosphate) were incompatible with the tin compound. The combination of stannous fluoride and calcium pyrophosphate is covered by U.S. patent 2,876,166 issued to the Indiana University Foundation. P&G has the exclusive right to its use. Incorporation of stannous fluoride in a toothpaste is not covered (though some people seem to have assumed so) by the foundation's patent.

**So Much For So Little:** Both Metal & Thermit Corp. (by far the major supplier of the tin compound, stannous fluoride) and Baker & Adamson Chemicals, Division of Allied Chem-



CW PHOTO—W. ROSENBLUTH  
**Three fluoride-using toothpastes.**

ical, another supplier, say they have experienced a lot of interest in the material since the ADA action but neither will name its customers.

Actually, the stannous fluoride market is not nearly so large as it seems; and it's doubtful that producers are earning large profits from it. Using a \$2/lb. price (an approximate figure), for stannous fluoride and assuming that the material would be used at the rate of about 0.4 grams/100 grams of toothpaste, a dollar's worth of stannous fluoride should supply enough additive for over 500 large-size tubes of toothpaste. Any benefits would appear to accrue to the toothpaste maker — who has a new ingredient to promote in his sales pitch — not the chemical supplier. It's not unlike the situation with topical application of stannous fluoride. A dentist pays 10¢ for a one-shot package may get \$5/application.

**Teeth for Two:** Like the Cheshire cat, toothpaste additives appear dramatically, shine brightly in the public eye for a while, then gently fade away.\* A two-year period seems to be the longest a toothpaste maker can count on for sustained public interest in a particular additive. In the last decade the public has been exposed successively (at roughly two-year intervals) to ammoniated toothpastes, anti-enzymes, fluorides, hexachlorophene toothpastes, and now the fluorides again.

The "ammoniated" toothpastes introduced in '49 were one of the first types to receive the "magic" additive

\* For a comprehensive look at the history of toothpaste additives see *Chemical Week*, October 22, '55 p. 118 and *Cosmetics, Science and Technology*, Interscience Publishers, New York.

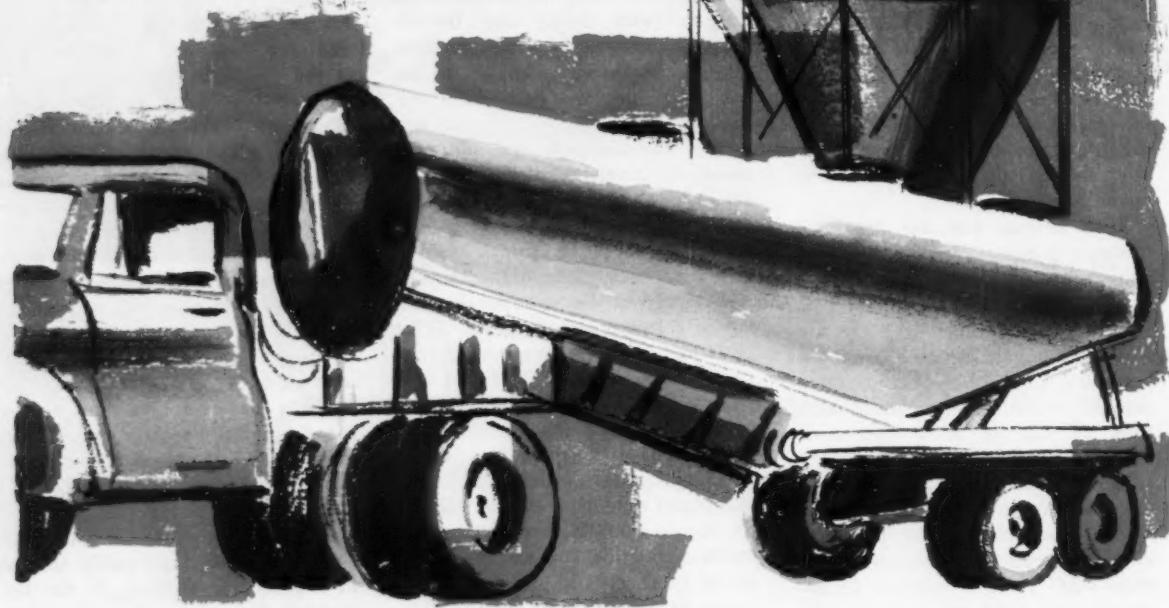
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**MINERAL PRODUCTS DIVISION**

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## SPECIALTIES

buildup. These used about 3% urea and 5% dibasic ammonium phosphate as the therapeutic agent. The ammoniated toothpastes also had academic backing. The University of Illinois did considerable research in this area with licensed manufacturers who wanted to make that kind of product. Block Drug's Amm-i-dent was one of the big sellers.

After the ammoniated toothpastes the chlorophyll derivatives, e.g., sodium copper chlorophyll, made a brief appearance and Lever's Chlorodent became one of the country's top brands. You can hardly find it on the market today.

The next magic additive was the anti-enzyme inhibitor. Chemicals used for this purpose included sodium dehydroacetate, sodium lauryl sulfate (going back to Lever's Irium introduction prior to WW II) penicillin, and sodium N-lauroyl sarcosinate (Colgate's Guardol).

The fluorides came next when P&G brought out Crest in '55 followed by the Colgate and Bristol-Meyers entries.

After the fluorides the only therapeutic agent to generate much excitement was hexachloraphene. Lever was first to use this in the U.S., put it into its Stripe toothpaste in '58. Bristol-Meyers was the only other major toothpaste maker to follow suit, incorporated it into Ipana.

For the immediate future the fluorides and anti-enzymes appear to be the most promising field for therapeutic agents. In the anti-enzyme area the problem is to develop additives that allow the anti-enzyme to adhere better to the teeth (they need a relatively long contact to do much good). Also, new anti-enzyme materials can be expected to reach the markets that are chemically unrelated to existent types.

**Fortunes in Fickleness:** Though P&G seems to have struck the mother lode in tin, it may find the vein running out soon. That is, if the pattern of the last decade holds up. Other additives before the fluorides have had university research groups behind them; others have had impressive results to point to; others have had million dollar promotions — and have faded. But for the chemical specialties maker looking for new markets dentifrices may still offer an intriguing potential.

*From Wyandotte Key Chemicals*

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**Yes, more than 4 million 1961 cars will have urethane foam parts in them using Wyandotte Key Chemicals. Why? Because these foam manufacturers have found that they can get higher quality at practical costs with Pluracol® polyols—diols, triols, tetrols, hexols. And their customers like the results. May we help you up quality and keep competitive in urethane foams?**

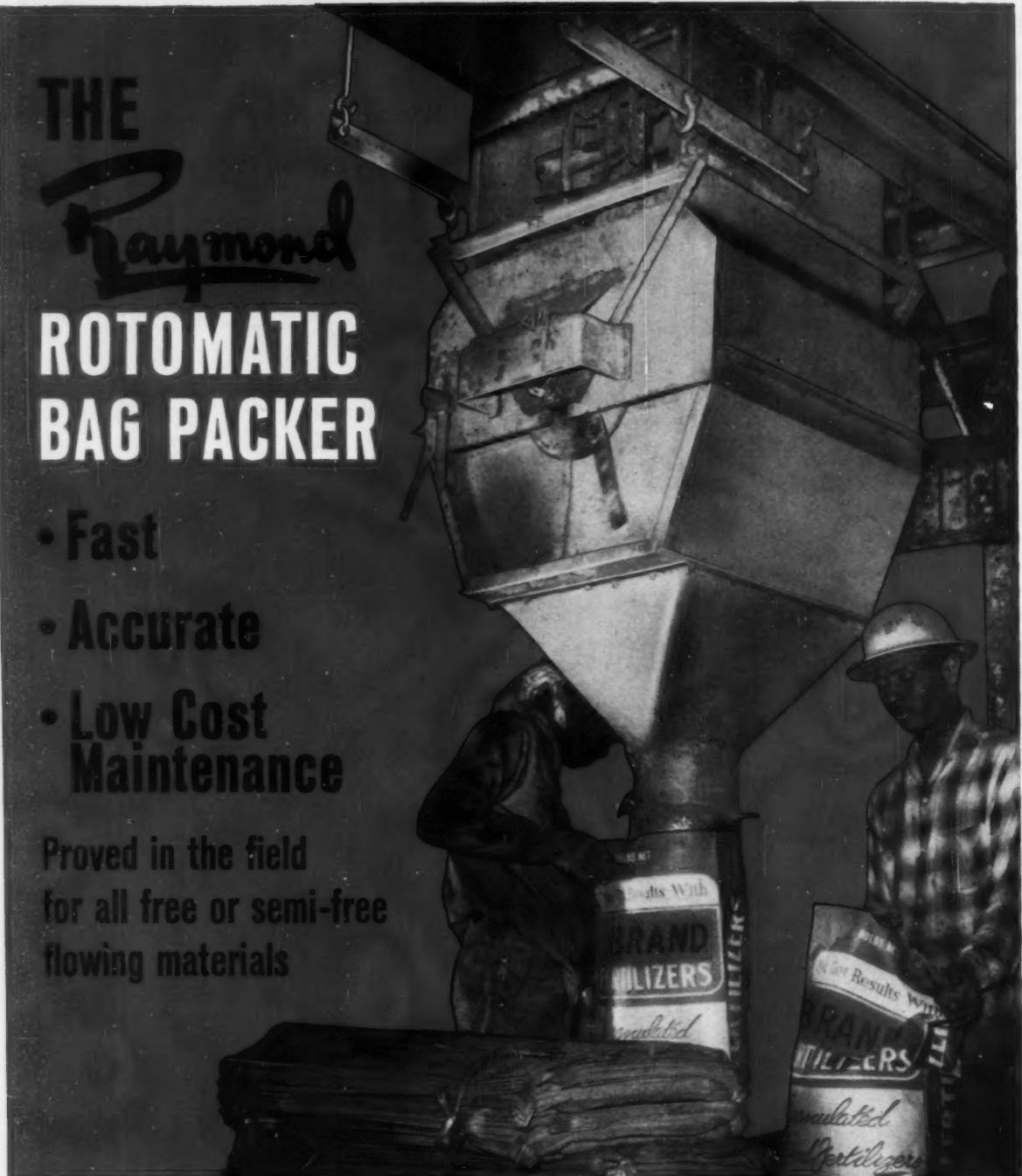
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## SPECIALTIES

### Pushbutton Promise

Risdon Manufacturing Co. (Naugatuck, Conn.) has reportedly developed a system that permits the successful packaging of antiperspirants in aerosol containers. Up to now, the problem has been to avoid the crystallization of aluminum salts that cause corrosion and clogging of the aerosol valve. Risdon's solution is a nonmetallic valve (to prevent corrosion) and a self-sealing cap that acts as a "cork" (to stop drying of salts) for the package. The valve (called Vapor Mix) and closure (Seal Dome) can be used on all types of push-button containers, e.g., glass, aluminum, plastic, having a 20 mm. or one-in. diameter opening.

U.S. market for deodorants and antiperspirants is figured by Risdon at almost \$100 million/year. Other areas in which the valve might prove usable are adhesives and other formulations that clog aerosol valves.

### PRODUCTS

**Three from Tennessee:** Tennessee Corp. (Atlanta, Ga.) is offering commercial quantities of three new items: Sul-fon-ate BL Acid, a nonresylic acid-mercerizing penetrant that functions as a wetting agent and penetrant in caustic soda strengths up to 25%; Tennesoft 23-59 and Tennesoft 29-73 are two new liquid softeners designed for cotton and cotton-blended fabrics. They are recommended for finishing terry or huck toweling, sheetings, diapers, and knitted cotton fabrics, may be used as sole finishing agent or with thermosetting resins.

**Vinyltoluene Copolymers:** Degen Oil & Chemical Co. (Box 5C, Kellogg St., Jersey City, N.J.) is offering commercial quantities of vinyltoluene copolymers under the tradename Vintols. They're designed to meet the need for inexpensive, quick-drying vehicles in coating applications.

**Contrast Control:** A variable-contrast control system, using a single solution for developing and fixing black and white films, is being offered by Cormac Chemical Corp. (Long Island City, N.Y.). Once development to the desired contrast is completed, fixing agents within the solution take over, complete the processing. Pre-

*From Wyandotte Key Chemicals*



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## SPECIALTIES

viously a combined developer and fixer could produce only a constant contrast.

**Paint Spray Coating:** A new coating for paint spray booths has been developed by Kelite Corp. (Berkeley Heights, N.J.). The material, called Paint Guard, is ready for use without dilution, is a nontacky paste, odorless, nontoxic and nonflammable.

**Vinyl Plasticizer:** A vinyl plasticizer with high solvating power is being offered by Union Carbide Chemicals under the name Flexol Plasticizer RK-1. It's said to have higher vinyl resin solvating power, lower asphalt solvation, less migration to asphalt and rubber and greater oil resistance than other vinyl plasticizers. Price of the new material: 24½¢/lb. in tank-car lots; 26½¢ in truckload lots of drums (f.o.b. shipping point).

**Low-Inhibitor-Level Monomer:** Methyl acrylate and ethyl acrylate monomers having an inhibitor concentration of only 15 parts per million are being offered by Rohm & Haas. Formerly, these monomers had been supplied with an inhibitor content of about 200 ppm. to provide stability during shipping and storage. The low-inhibitor-level monomers provide shorter polymerization time, more complete monomer-to-polymer conversion and less tendency for color development. They can withstand heating to 130 F for at least 30 days without evidence of polymer formation, according to Rohm & Haas.

**Epoxy Casting Compound:** A low-viscosity epoxy impregnating and casting system that will withstand continuous operation at temperatures up to 500 F is being marketed by Mereco Products Division of Metachem Resins Corp. (530 Wellington Ave., Cranston, R.I.). It's called Mereco 43-12, is suggested for use in vacuum impregnating operations. It's supplied as a 1-to-1 part resin and activator, has a viscosity of 1090 cps. at 25 C.

**Paper Resin:** Dow Chemical has developed Mydel 550, a copolymer resin of acrylamide and acrylic acid, to improve dry strength of paper. It's said to be particularly effective on board chemical pulps and ground-wood pulps.

*From Wyandotte Key Chemicals*

# urethane foams for insulating new 1961 refrigerators



Each application of urethane foam (even from one user to another in the same industry) is different. No one polyol can solve all needs . . . to say nothing of maintaining high quality. Because we have a whole series of polyols—Pluracol® diols, triols, tetrols and hexols (and the skill to apply them)—we can work out with you the right polyol, or blend of polyols, that will meet your needs exactly and economically. Contact us.

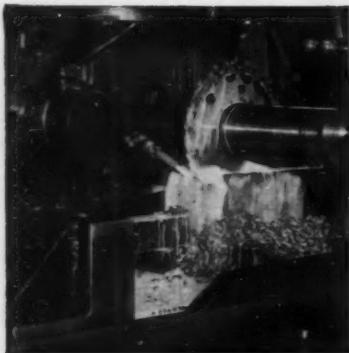
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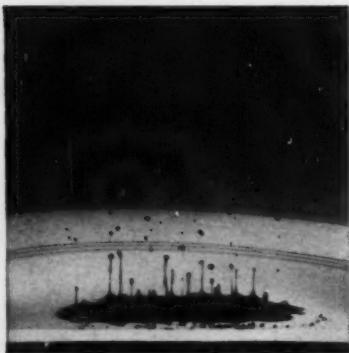
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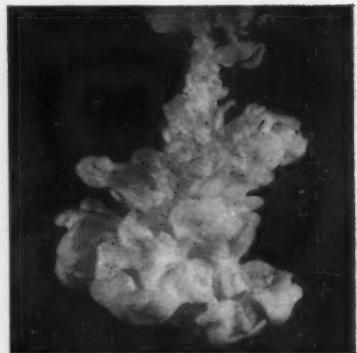
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The organizations whose products are listed above are all subsidiaries and divisions of Witco Chemical Company, Inc. Together they represent sources for a unique range of surface-active products for industrial, agricultural and domestic applications. Further information on each group of products is available in our brochures:

Please Indicate which meets with your interest—we will be happy to forward it immediately.

- "Sonneborn Purified Petroleum Sulfonates,"
- "Ultra Surface Active Agents and Their Applications,"
- "Emcol Surface Active Agents."

**WITCO CHEMICAL COMPANY, INC., Dept. S-230, 122 East 42nd St., New York 17, N.Y.**

# Technology Newsletter

CHEMICAL WEEK  
September 2, 1961

**A new approach to prevention of ozone cracking** in some of the new synthetic rubbers may be signaled by recent work done by Polymer Corp. Ltd. (Sarnia, Ontario). The background:

Some elastomers, such as butyl, have inherently good resistance to ozone. Satisfactory anti-ozonants have been developed that work for other rubbers. Blending of elastomers could be an important means, too. In fact, polyvinyl chloride is already used as a blend in nitrile rubbers where petroleum waxes and anti-ozonants have some limitations.

Polymer Corp. has found that a copolymer of ethylene and propylene can impart ozone resistance to a variety of rubber materials (Canadian Patent 624,563). This could be important if ozone attack becomes a serious problem in new polybutadiene truck tires, for example. Farm equipment tires, which are also subject to lengthy and severe weathering conditions, are another possible target.

Actually, a number of organizations are interested in ethylene-propylene copolymers for tires. And the aging characteristics of these compounds have been well recognized. But Polymer feels it is the first one to discover their usefulness against ozone.

## News on epoxy resins on two fronts:

• Koppers, as it dedicated its new research center at Monroeville, Pa. last week, revealed it is in commercial production of a new series of epoxide resins. Called KER resins, they're formed by reacting an ortho cresol-formaldehyde novolak with epichlorohydrin. The molecular weight of the novolak determines the molecular weight of the resin, which may have a functionality to from 2.5 to 5.5.

Most epoxies have only two reactive epoxy groups available. The additional functionality of its resins, says Koppers, permits more cross linking and improved thermal stability and high resistance. It also gives the formulator more flexibility in modifying properties and allows shorter curing times.

• Furane Plastics Inc. (Los Angeles) is bringing out a new line of transparent rigid and semirigid epoxies capable of curing at room temperatures. The company reports the products are under consideration for transparent glazing for aircraft and missiles, potting and encapsulating materials for electrical applications and as adjuncts to structural assemblies.

• **Some progress toward development of a cancer vaccine:** Sergio De Carvalho, director of cancer research for Rand Development Corp. and A. R. Taylor of Parke, Davis reported discovery of a virus that may cause cancer in human beings. A research group extracted the virus from cancer patients, found it caused cancer in animals. The work was reported

# Technology

## Newsletter

(Continued)

at last week's 19th annual meeting of the Electron Microscope Society of America at Pittsburgh.

Because cancer antigens cause healthy animals to produce specific antibodies, it's possible to use a gamma globulin fraction from the serum of such animals as a vaccine. It has been successfully tested on animals and is now being tested on human beings.

**The Soviets are experimenting with oxygen and natural gas** for use in blast furnace operations, too (*CW*, July 8, p. 63). According to the Czech Technical Digest, at the Petrovsk Metallurgical works introduction of 100-110 cu. m. of natural gas per ton of pig iron cut coke consumption 10-15%, boosted output 5%. In other blast furnaces, it was reported that use of oxygen and natural gas together reduced coke requirements 20%, increased production 10%.

**New insight into the growth of bacteria in hydrocarbons** may have commercial ramifications. R. J. De Gray, of the research department of Standard Oil Co. (Ohio), reported to the American Institute of Biological Sciences at Purdue this week that bacteria can exist in hydrocarbons without the presence of free water and that he had found a boron compound that will kill them. (Previously, it had been thought that bacteria utilize hydrocarbons as food only in the presence of water; for the most part, this takes place at the interface of the water and hydrocarbon.)

**Significance:** Bacteria can clog jet fuel lines and cause the lines and tank to be more susceptible to corrosion. Refiners circumvent this by keeping the fuel dry and washing and filtering it. But as De Gray sees it, some microorganisms survive, then multiply rapidly as soon as moisture enters the system. He reports they can be killed by intensive drying of the fuel, but indicates an effective biocide would be better. He's continuing research, expects to have a conclusive answer soon.

**A new transistor that can handle up to 40% of the jobs** carried out by more than 2,000 different varieties of units now on the market is on display this week at the 1961 Western Electronic Show and Convention in San Francisco. Developed by Radio Corp. of America, it is, the firm says, the closest thing yet to a universal transistor. It combines triple diffusion and planar manufacturing techniques in a single transistor. The product, the 2N2102, is due for introduction to commercial and military markets next month in the \$12 range for production quantities.

**New dyes for spandex (urethane) elastic fabrics** (e.g., DuPont's Lycra and U.S. Rubber's Vyrene) have been introduced by Althouse Chemical Division of Crompton and Knowles (Reading, Pa.). Called Spanyl, they're applied by standard dyeing procedures, are said to be the first successful ones. The new series includes yellow, orange, maroon, red, blue and grey.

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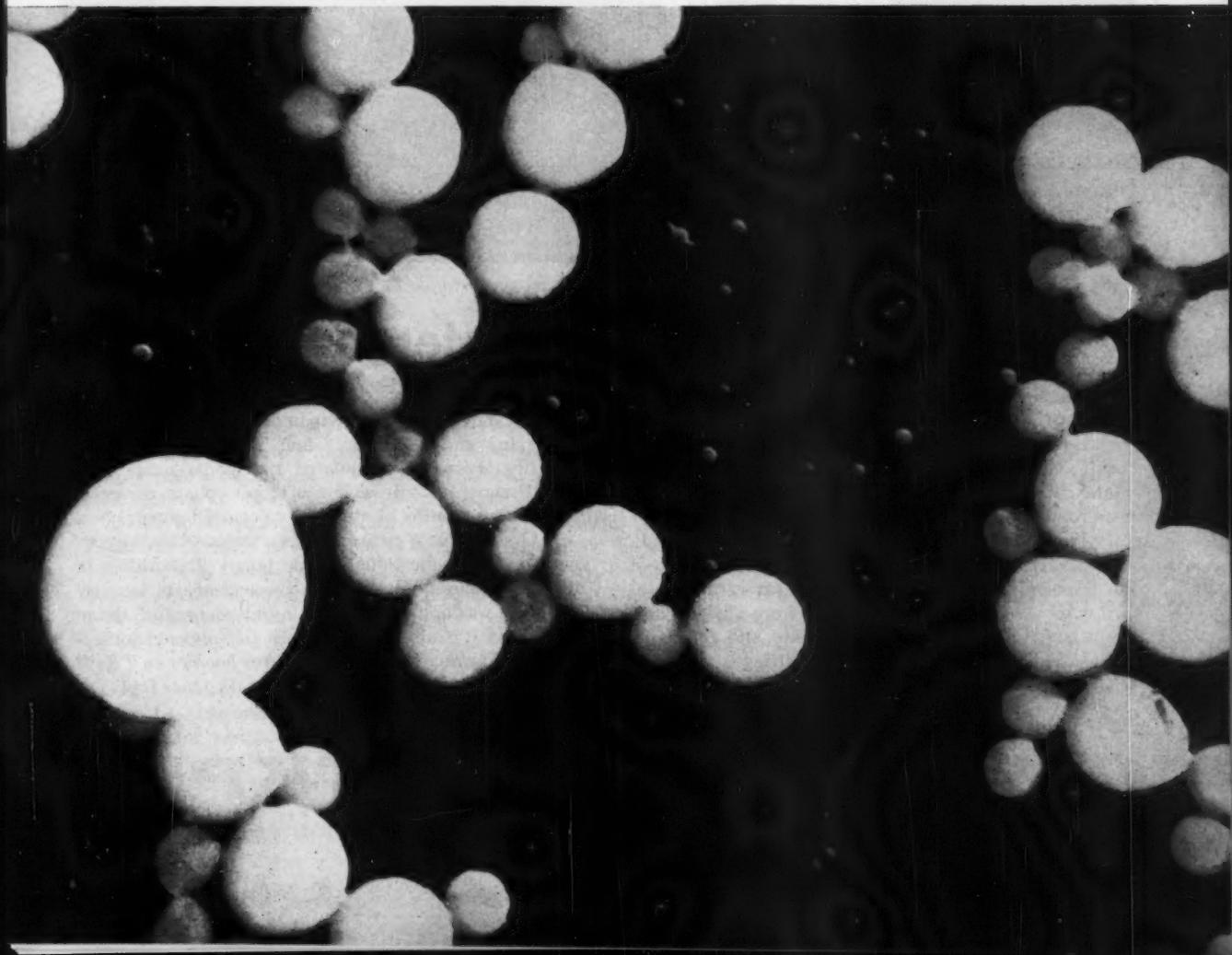
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Electron micrograph of polyvinyl acetate emulsion





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## Cold Stretch for Stronger Process Units

The frost-covered steel pressure vessel (photo, below) has just been removed from a pit in the ground where it was cold-stretched at  $-320^{\circ}\text{F}$  to increase the tensile strength of the metal by more than 250%. This cold-stretching technique, called Ardeforming, is a new metal-working process revealed last week by Arde-Portland, Inc. (Paramus, N.J.), which may be capable of producing lower cost stainless-steel pressure vessels and piping for chemical processing.

Ardeforming has been developed primarily for solid-propellant rocket casings, boosts the strength-to-weight ratio of steel casings to within the range of titanium and filament-wound glass fiber casings—viz., almost 1 million in. for steel vs. 1.1 million in. for beta titanium and 1.6 million in. for glass fiber (*CW Technology Newsletter*, Aug. 26). But because the strength-to-weight ratio increase is achieved at low cost, Arde-Portland is looking beyond the rocket-casing market to process industry applications.

For example, a chemical processing pressure vessel made by Ardeforming could cut equipment cost. An ordinary vessel, because of the design safety factor included, would probably be designed for tensile strength of about 18,500 psi.—one-quarter the minimum tensile strength for 18-8 stainless steels (18% chromium, 8% nickel steels in the 300 Series). Ardeforming increases the tensile strength of 18-8 stainless steel to 260,000 psi. (A-P predicts it will achieve 380,000-400,000 psi, within a year.)

Allowing for the safety factor, the increase in tensile strength would mean an increase in design strength to about 65,000 psi., result in a vessel of less than one-third the weight of an ordinary one of comparable strength. And, in addition to reducing material costs, the lighter-weight vessel would require smaller, less costly, foundations.

**Cold Shoulder for Cost:** Ultimate cost of the Ardeformed vessel would depend on the design of the vessel—its wall thickness, etc. But in general, the chilling technique is considerably less expensive than heat treating—the most commonly used method for in-

creasing strength. Cold stretching is performed in a pit dug in the ground, eliminating elaborate heat-treating facilities which also limit the size of equipment that can be processed. And welding and fabricating costs are lower because Ardeforming can tolerate metal-working distortion.

In Ardeforming, the steel is rolled and welded before it is chilled and stretched. This overcomes the important disadvantage of cryogenic-working methods (such as Zerolling, which has not been commercialized) for increasing tensile strength, because welding, which is performed after the chilling operation in these methods, reduces much of the strength improvement.

No attempt is made to control dimensions during Ardeform welding because all bends, dents and distortions are removed during the cold stretching operation. And, although welding quality must be good to permit stretching of 13% or more, no attempt is made to fight shrinkage that normally occurs in welds.

After fabrication, the vessel is placed in an insulated forming tank inside the ground pit. Liquid nitrogen cools the vessel to  $-320^{\circ}\text{F}$  and gaseous nitrogen stretches it into a stainless-steel die of the shape of the finished vessel. No die is needed for vessels of spherical shape. But to produce an open-end cylinder, dummy heads have to be fabricated in order to form a closed vessel that can be pressurized and stretched. After stretching, the heads are cut off.

Attachments required on some vessels (e.g., flanged openings) call for special techniques if they must be welded to the vessel after stretching. Heat generated by the welding weakens the vessel locally and it must be returned to the forming pit for restretching without a die at pressures below the original stretching pressure.

**Decoding:** The major roadblock to CPI use of pressure vessels and piping made by Ardeforming is the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers. No allowance is made for vessels worked at subzero temperatures after fabrication. And, unless

pressure vessels are made according to code specifications, it may be difficult to obtain insurance underwriter approval.

However, it is possible for a firm to obtain approval from the code committee to build a vessel on a case (i.e., test) basis—provided design data is satisfactory. And, if a vessel is to operate at pressures above 3,000 psi., there is no actual code coverage or approval—a point that has been under debate for some time (*CW*, May 7, '60, p. 59).

That the Ardeformed vessel has already withstood several thousand pounds pressure during stretching is a good indication that it will pass normal hydrostatic testing.

Moreover, although the Ardeforming process is new, the basic principles of subzero working austenitic stainless steels to add strength and ductility have been known for many years. Considerable supporting data have been accumulated.

The International Nickel Co.'s experimental data on subzero working is



Frost-covered vessel is removed from cold-stretching pit at Arde-Portland.



## Low Cost Computer for the Process Industries

A sophisticated low-priced control computer with capabilities ranging from simple logging to closed-loop control, the TRW-330 brings you a new standard in flexibility. You can start with a small basic system that matches your current requirements and then add capabilities as you need them.

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**TRW-330 CAPABILITIES** — TRW-330 computing speeds exceed those of competitively priced machines; addition instructions can be performed in 260 microseconds, including access time.

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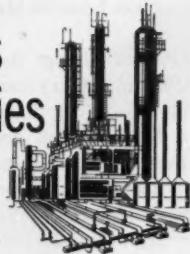
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# TRW-330 applications in the process industries



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## PRODUCTION

dated as early as 10 years ago. And, Inco's stainless-steel section, headed by C. Roger Sutton, is continuing to sponsor work in the area—at Southern Research Institute (Birmingham, Ala.) on subzero working and properties of steel at cryogenic temperatures, and at Stanford Research (Palo Alto, Calif.) on shock loading (e.g., explosive hardening) at cryogenic temperatures to increase the strength of heavy sections (about 3-in. thick).

**Powers of Suggestion:** Charles Mayne of Inco's stainless-steel section briefly suggested a vessel fabricating technique that is a carbon copy of Ardeforming while presenting a paper on subzero working at the American Society for Testing Materials last year, without knowing that A-P was already quietly working on the method. Benjamin Aleck, A-P's research director and inventor of the process, immediately contacted Inco, which has since been cooperating on experimental data exchange.

To explain the strength increase in stainless steel by cryogenic working, Mayne says that there is a "shear-induced phase transition, similar to that obtained when carbon steel is heated and quenched." But, Mayne hesitates to identify the phase change. Essentially, it has to be from austenite to ferrite—yet, ferrite is commonly brittle while the cryogenically worked stainless is ductile. Explanation for the ductility: the very low carbon content of the 18-8 stainless steels.

A good indication of the strength and ductility of the stainless steel vessels and welds stretched by A-P is that in failure tests, no failure has been catastrophic. When vessels have burst, they have not shattered, scattering metal fragments—instead have cracked open.

No failures occurred at the welds, and notches cut in the vessels or marks scribed on their surface have not influenced the failure point. Measurements at the point of failure have shown the metal to be about 7% thinner—a good indication of ductility.

Thus far, A-P has regularly subjected metals to 15½-16% stretch. Tensile strength increases with the amount of stretch but the limit for stretching is about 22%. The firm is working with Eastern Stainless Steel Corp. (Baltimore) on alloys to obtain additional strength. The tensile strength of 18-8 stainless steels is in-

creased most by cryogenic stretching (e.g., 102,000 psi. to 260,000 psi.). However, other stainless grades exhibit significant strength increases—and A-P is eyeing the stretch potential of other metals such as aluminum and titanium.

Corrosion testing so far indicates there is no significant difference between the ordinary stainless steel and cryogenically worked steels. And, the corrosion resistance of welds may be improved.

**Temperature Limitations:** One drawback of the stretching technique is the loss of metal strength at temperatures above 800 F. This might limit use of the method for fabrication of heat exchangers—i.e., strengthening tubing and simultaneously expanding it into a pressure joint with the tube sheet.

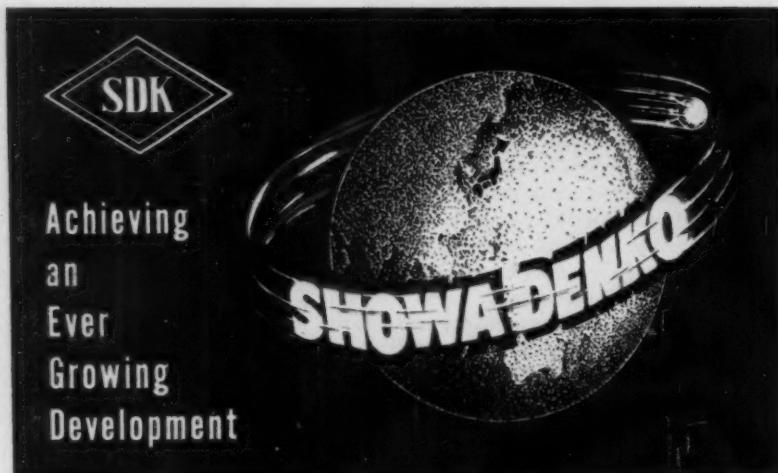
However, in low temperature service, increasing strength by stretching offers a bonus. Lighter-wall piping that will actually stretch and strengthen while in process operation can be put into cryogenic service.

Most experimental work in process industry applications remains to be done. But if cost savings prove as great as expected, chemical firms are certain to try the subzero-stretching technique for high-strength pressure vessels, piping and other equipment.

## EQUIPMENT

**Pressure Regulator:** A new line of back-pressure regulators is now being offered by Dover Corp.'s OPW-Jordan Division (6013 Wiehe Rd., Cincinnati 13). According to OPW-J, the valves obtain tight shutoff with self-cleaning, self-lapping, stainless-steel sliding gate seats. The self-operated valves, called series #165, are designed to maintain a constant back pressure in a vessel or pipeline. The valves are available in ¼- to 2-in. sizes, in ductile iron and bronze for 250 psi. at 500 F, and in stainless and cast steel for 300 psi. at 600 F.

**Centrifugal Compressor:** A new, single stage centrifugal compressor built for high-temperature, high-pressure applications has been introduced by Roots-Connersville Blower, division of Dresser Industries Inc. (900 W. Mount St., Connorsville, Ind.). It is recommended for high-purity chemicals, since there is reportedly no need



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#### PRODUCTION

for lubrication within the compressor. The unit is designed for working pressures between 50 to 500 psig., temperatures to 800 F and inlet capacities between 500 and 5,000 cfm.

**Penton Lining:** Dow Chemical Co. (Midland, Mich.) has just added Penton lining (chlorinated polyether) to its line of corrosion-resistant pipe, valves, fittings and pumps. The Penton-lined products are recommended for high-temperature (225-250 F) corrosive service. Penton is said to resist corrosion and retain dimensional stability in a wide variety of chemicals. Currently, Dow's lined products have used saran only.

**Control Valve:** Falls Industries Inc. (Aurora Rd., Solon, O.) is out with a new graphite control valve. The valve is especially designed to resist corrosion and thermal shock, FII says. The unit has a teflon-to-graphite single seat with a split body construction. It is recommended for use at operating temperatures up to 340 F and pressures up to 75 psi. The valve is available in 1- to 1½-in. body sizes ½-, ¾-, 1-, 1¼- and 1½-in. port diameters with standard ISA face-to-face dimensions.

**Steam Trap:** A new float thermostatic steam trap is now available from Farris Engineering Corp.'s Mil Division (504 Commercial Ave., Palisades Park, N.J.). A special rocker design is said to simplify mechanical linkage, permitting greater compactness with less sticking and wear. Its uses include: heaters, heat exchangers, steam tables, stills and autoclaves. The valve comes with ¾-in. pipe threads, for 30-, 75-, and 150-psi. steam pressure.

**Drum Filter:** Peterson Filters & Engineering Co. (1945 S. 2nd W., Salt Lake City) is now manufacturing a new drum filter with a special fluid tension roller. According to PF&EC, this roller keeps the cloth spread for maximum efficiency and eliminates zipper and fabric overstressing. Key to device: a system called BICRAFT (Built-In Control Reliability and Fluid Tension)—a closed loop system that automatically keeps a constant tension on the filter cloth as it's continuously removed and returned to the drum.

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Shell has three benzene-producing refineries, located near waterways. Barges like these will carry the bulk of 1961's record output.

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**Shell has increased benzene production  
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80 million gallons per year**

**Shell has increased its benzene production nearly 500 percent in less than 18 months. Shell's benzene-producing capacity in the U. S. is now the largest in the world.**

**Shell's stepped-up output comes to you via a nationwide supply network served by 3 refineries.**

**Read how Shell's increased benzene production can help you meet your rising benzene requirements now.**

**W**ITH DEMAND for benzene at an all-time high, and with new uses coming along each year, Shell is producing more benzene now than ever before.

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# Market Newsletter

CHEMICAL WEEK  
September 2, 1961

**West Coast producer Shelly Urethane is now negotiating to acquire an unidentified Eastern urethane manufacturer. If the deal is completed next month as expected, Shelly's annual sales will be boosted from current \$2 million/year to \$5.6-million/year.**

Two months ago Shelly moved into a new plant in the West, marking the firm's fifth expansion in 10 years. Current expansion, due for completion in a couple of months will give Shelly 130,000 sq. ft. of plant area on its 4-acre site—a significant increase over the 30,000 sq. ft. of plant space into which the company moved only 18 months ago.

**The big boom in synthetic foam use has pushed relatively low-priced polyurethanes to an estimated 100-million-lbs./year market volume; most of urethane's current uses were formerly handled with foam rubber.**

Industry experts figure that urethanes now account for nearly 50% of the furniture cushion business, all aircraft seating, and in the next two years will corner up to 90% of automobile cushioning (compared with about 10% last year, 50% this year.)

**Goodyear Tire & Rubber is revamping its foam marketing tactics** to clear up problems which result in part from intracompany competition in the latex-polyurethane foam battle. Some products, hampered by overcapacity and sacrifice prices, are being eliminated.

For example, cut-to-size polyurethane foam (Pliofoam) and bulk filling latex (Plio Core) will be withdrawn from "certain types of business." Goodyear will concentrate on custom-molded furniture cushions, fabricating utility pieces, solid latex slap, and automotive parts (largest share of market).

Goodyear figures that it doesn't pay to install urethane capacity in Texas, California and other areas of the far West—hence has been buying from other producers to service Goodyear customers. But in its new scheme, it will no longer actively sell in these markets. Goodyear will also close shop in an undefined area between Eastern producing plants and the far West where shipping charges eat up profits.

**Urethanes are knocking most of the remaining bounce out of foam rubber markets.** Current sharp reductions in latex foam output by several companies point up an accelerating foam rubber malaise that has been felt for some time (*CW Market Newsletter, April 8*).

American Latex closed down foam rubber operations several months ago; and there's trade talk that Hewitt-Robins has done likewise and that Dunlop in Buffalo is making foam rubber only for mattresses.

**As expected, some fast price shuffling last week brought phtha-**

## Market Newsletter

(Continued)

late ester tabs down 1¢/lb. for most varieties. Price reductions on the esters were considered virtually inevitable when phthalic anhydride tabs went down 2¢/lb. a week earlier (*CW Market Newsletter*, Aug. 26).

The rapid-fire price maneuvering that took place last week apparently began when Union Carbide—and reportedly one other producer working independently—chopped 3/4¢/lb. off most esters. But Monsanto trumped Carbide's play with a 1¢/lb. across-the-board cut and other producers, including Carbide, quickly revised prices to meet Monsanto's lower prices.

Monsanto wound up with a flat 1¢/lb. reduction on all phthalate esters it markets, as did Carbide. Exception: di-tridecyl phthalate which went down only 1/2¢/lb. Reductions on other esters not conforming with the 1¢ general reduction included: diethyl phthalate, down 1½¢; di-isobutyl phthalate, down 1½¢; and dimethyl phthalate, down 1/2¢/lb.

**Cities Service Helex last week became the second firm to wrap up a government contract for production of helium from natural gas; first to sign was Helex Co., a subsidiary of Northern Natural Gas of Omaha, Neb. (*CW Market Newsletter*, Aug. 26).**

The contract with Cities Service calls for a 2-million-cu.ft./day plant at Ulysses, Kan. The government agrees to purchase \$9.1 million worth of helium annually for 22 years—and the company agrees to deliver at 600-million-cu.ft./year rate.

**India will probably import 40% of its fertilizer needs this year** despite the nation's \$1-billion fertilizer production program. Total fertilizer demand from March '61 to Feb. '62 will be close to 2.7 million metric tons (expressed as ammonium sulfate). Approximate breakdown (tons): ammonium sulfate 1.39 million; urea 252,564; ammonium sulfate and nitrate, 307,859; calcium nitrate, 314,143.

To supplement domestic production amounting to about 60% of total demand, India is working out this year's imports on the basis of availability of foreign exchange. There's increasing tendency in New Delhi to buy fertilizers from East European countries to take advantage of rupee payments.

**U.S. Borax & Chemical has signed an agreement with Vitro Chemical to distribute Vitro's rare earth products to glass and ceramic industries; Vitro will handle its own sales in other areas, e.g., electronics, metals and alloys, nuclear, optical.**

U.S. Borax recently set up a similar marketing agreement with Lithium Corp. of America covering sale of lithium compounds used by ceramic and glass producers in the U.S., Canada and Mexico.

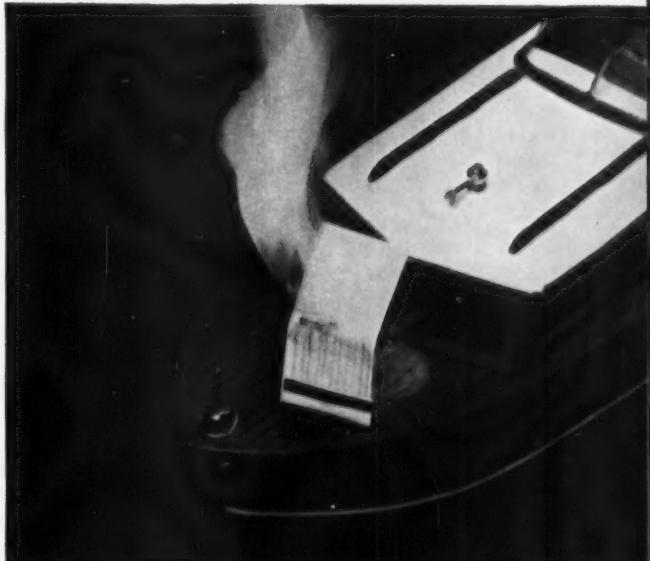


THE COMFORT AND LOW COST of this urethane foam mattress were both made possible by M&T Catalyst T-9, one of many stannous and organotin catalysts developed by M&T for use in the new "one-shot" foam process. Tin chemicals have proved to be unusually versatile as catalysts and stabilizers, and biocidally active organotins are finding rapidly widening application as bacteriostats, fungicides, algicides, textile purifiers and as repellents for rodents and marine growth.



HIGH TEMPERATURES ARE ROUTINE as zirconium, antimony and tin opacifiers are evaluated in M&T's newly expanded Ceramics Research Center. Plant conditions are simulated in the firing of glazes and enamels to determine optimum formulations. The Ceramics laboratories are just one of the many specialized research and development facilities working for M&T customers.

Work in inorganic tin chemicals led to organic tin chemicals. These in turn led to other organometallics until M&T now operates a versatile plant that produces the largest variety of organotins and organometallics in the country. From this modern M&T plant come stabilizers, catalysts and biocides on which entirely new products and new manufacturing methods have been based.



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Sn Sb P | organometallics  
Si Ti Zr | and inorganics

METAL & THERMIT CORPORATION GENERAL OFFICES: RAHWAY, NEW JERSEY IN CANADA: M&T PRODUCTS OF CANADA LTD., REXDALE, ONT.



## Ameripol Micro-Black cuts rubber mixing time 20%...

### steps up production at Bata Shoe

The Bata Shoe Company recently faced production problems in their winter line of footwear. When using free black, color contamination was delaying production. Whenever a light color run followed production of black items, Bata was forced to close the line while equipment was painstakingly cleaned. It was a time-consuming, messy job.

For Bata, the solution was a changeover to Goodrich-Gulf Ameripol Micro-Black Masterbatch. Using Ameripol 1605, the most delicate pastel shades now follow black with no contamination problems. And, equipment, employees and production lines stay clean. Mixing time

has been cut from a two-stage to a one-stage operation, saving as much as 20% in time.

If you manufacture shoes, tires, camelback, coated fabrics or any other black rubber products, consider Ameripol Micro-Black Masterbatch for this three-fold payoff . . . *in production* by eliminating weighing and milling operations plus shortening mixing time . . . *in storage* by eliminating in-plant handling of carbon black . . . *in products* by assuring thorough dispersion of carbon black in the rubber for increased abrasion resistance, lower heat build-up.

Put Micro-Black to work on your production line. Call your Goodrich-Gulf sales engineer. Or write us at 1717 East Ninth Street, Cleveland 14, Ohio.



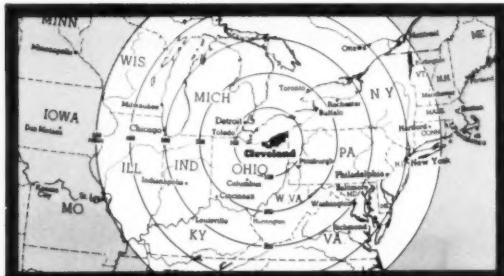
### Goodrich-Gulf Chemicals, Inc.

WORLD'S LARGEST SOURCE OF SYNTHETIC RUBBER

President, The Standard Oil Company (Ohio)

**Charles Spahr tells  
why he feels  
Cleveland-Northeast Ohio  
is better than ever**

"From our point of view, Cleveland-Northeast Ohio, widely known as 'the best location in the nation,' is now better than ever. The area has shown a steady growth in industrial output and in population. Of even greater importance, it is within 500 miles of more than half the nation's population—and it is abundantly supplied with facilities to reach this market by air, water, rail or road. To anyone engaged in marketing, this means a growing opportunity for the future."



**BEST LOCATION IN THE NATION.** Cleveland-Northeast Ohio is within 500 miles of 75% of America's industries, 60% of the population, 8 out of 10 of the nation's top markets.

**LAKE WITH A DUAL ROLE.** Primarily, of course, Lake Erie means an unlimited amount of cool water; but with the St. Lawrence Seaway, it also means world outlets for our products.

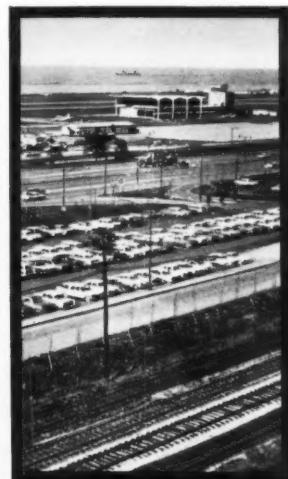


Whatever your needs, whether for national headquarters, sites for plants, research, distribution or warehousing facilities, look to Cleveland-Northeast Ohio. For specific information, write or call Richard L. DeChant, Manager of Area Development Department.



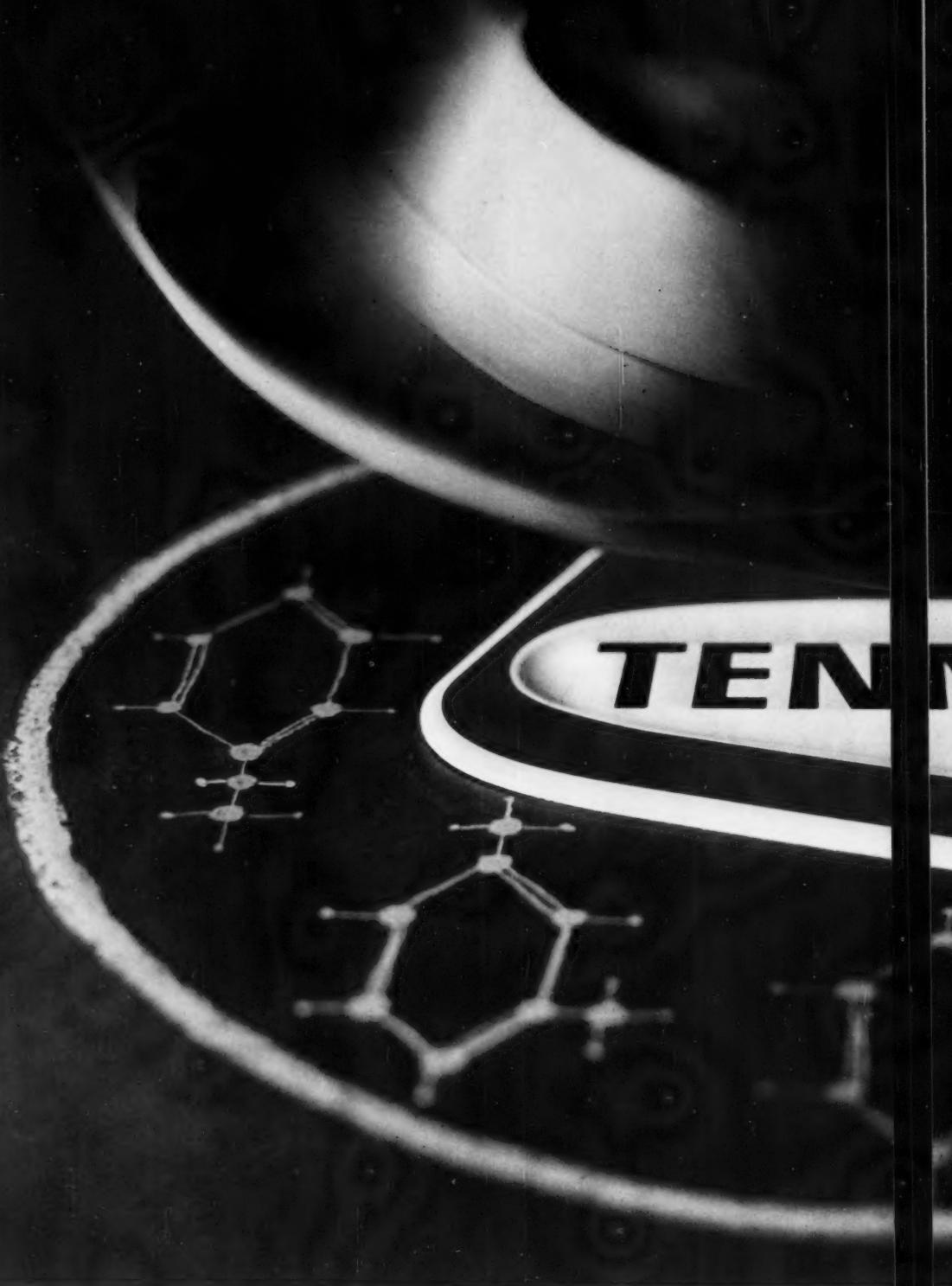
**RESEARCHVILLE, U.S.A.** Cleveland ranks 1st in Ohio, 4th in the nation, in research facilities. About 350 companies and over 16,000 workers are engaged in research here.

**TRANSPORTATION HUB.** "The best location" is served by nine scheduled airlines, eight railroads, and is near the Ohio turnpike for fastest overland bulk shipments.



**THE CLEVELAND ELECTRIC ILLUMINATING COMPANY SERVING  
Cleveland-Northeast Ohio**

the best location in the nation



***Our hat is in the ring!***

TENNECO . . . new name in petrochemicals . . . announces a line of top quality cost-saving aromatics: Benzene, Toluene, Xylene, Ortho-xylene, Ethyl-benzene, Meta-Para Xylene Concentrate, Aromatic Solvents for surface coatings and agricultural chemicals. All precision-produced to help you beat the cost-profit squeeze. We're in business, BIG! And with ideas to match . . . new ideas . . . new thinking . . . new concepts . . . with a line of petrochemicals dedicated toward one end—helping you ease the pressure of today's increasingly severe cost-profit pinch.



Want dependability . . . shipments that match or even better your most rigid specifications? Want service . . . the assurance that your order, large or small, tank car, barge, or tanker, will be shipped on time . . . as promised? Want quality . . . consistently high quality backed by the research, resources, integrity of one of America's great industrial leaders—Tennessee Gas Transmission Company? We've got the products, the organization and the facilities to serve you promptly, efficiently, dependably. When you need petrochemicals . . . and fast . . . *Think Tenneco.*

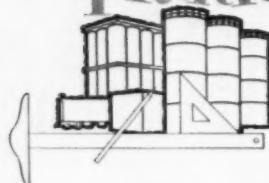


**THINK TENNECO**

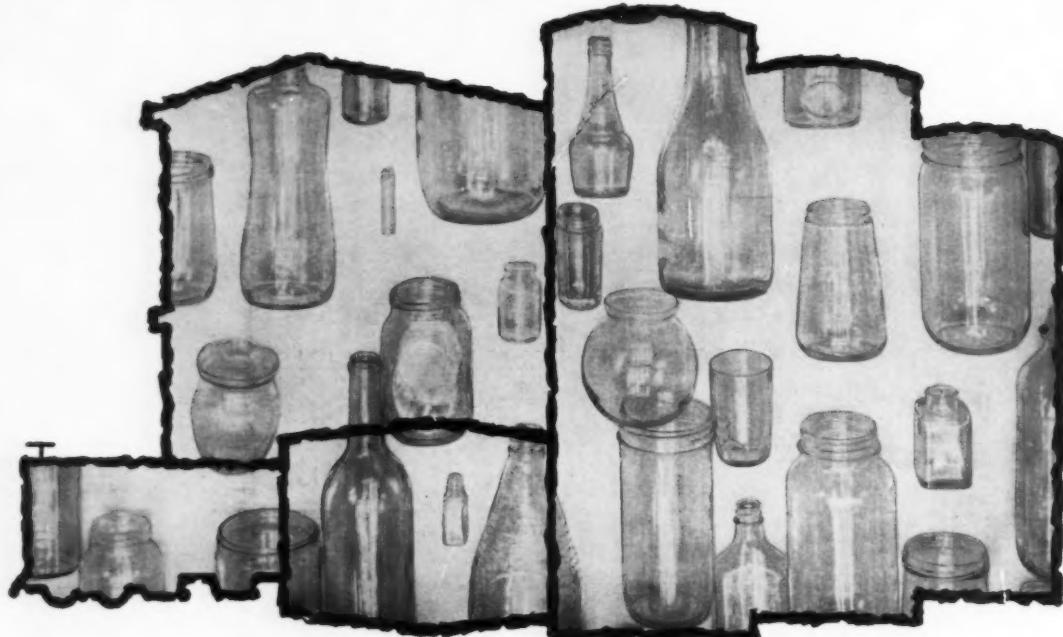
TENNECO OIL COMPANY  
PETROCHEMICAL SALES  
P. O. BOX 18, HOUSTON 1, TEXAS

WEST END

advance  
planning



OF EXPANDED SODA ASH  
PRODUCTION ANTICIPATES  
INDUSTRY'S GROWING NEEDS



 **WEST END** as the dependable soda ash source in the West for

36 years is constantly enlarging its facilities to serve a growing

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sources. Low cost production based on vast natural raw material

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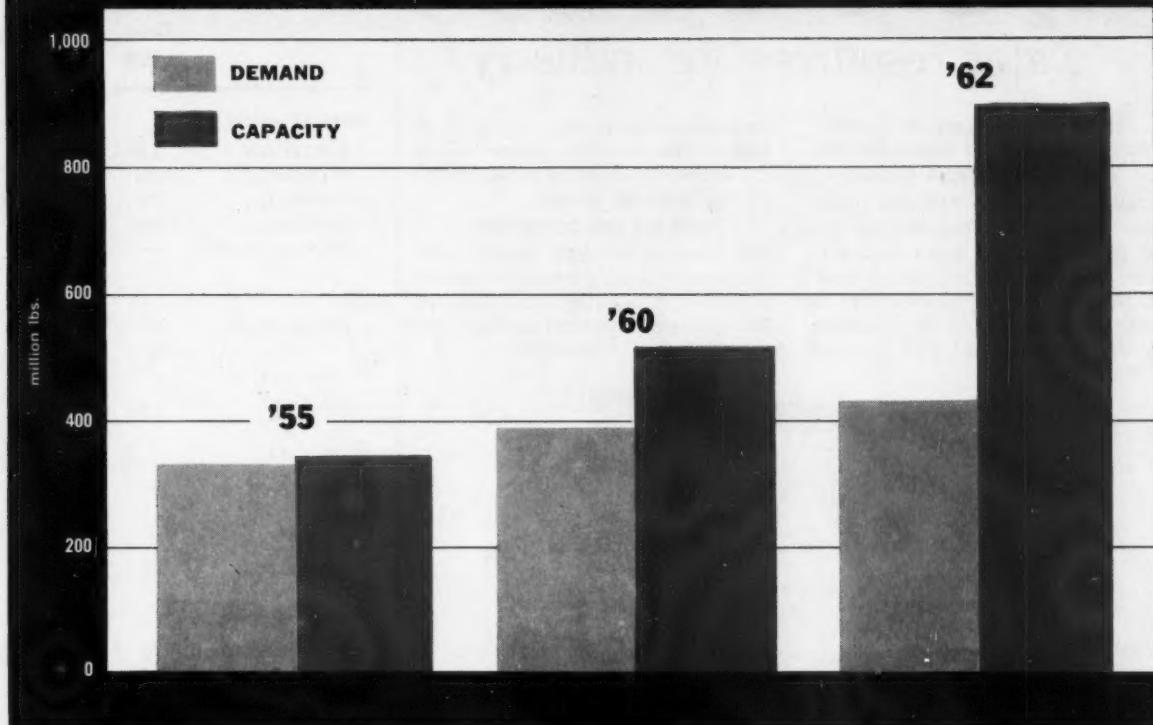
of customers promptly, regardless of market conditions.



**WEST END CHEMICAL COMPANY • DIVISION OF STAUFFER CHEMICAL COMPANY**

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## As Phthalic Supply-Demand Gap Widens — Prices Begin to Tumble



## Phthalic Prices—At Bottom Now?

Last week, American Cyanamid slashed its phthalic anhydride price 2¢/lb. across the board and other producers quickly followed suit. The cuts highlight the sorry phthalic situation—too much capacity and not enough demand—but probably won't alter it. As most observers see it, lower phthalic prices won't boost demand—they will only lower producers' profits.

American Cyanamid explains its decision "as a direct move to maintain a fully competitive position in a phthalic anhydride market which in recent weeks has shown a tendency towards weakening."

Other phthalic producers agree that some price cutting has been taking place recently, that Cyanamid's move is a good try at stabilizing the selling price throughout the country. But the already-weak price structure will be undermined even more as phthalic and naphthalene plants now being built

come onstream later this year or in early '62. Thus, despite most producers' firm declarations that they "expect no further price cuts for the short-term future," more price trimming should surprise no one.

**Figuring the Factors:** This outlook reflects the interplay of growing capacity, shifting outlets and raw materials, and pressures from competing products.

At the end of last year, U.S. phthalic anhydride productive capacity was rated at 504 million lbs./year. Demand at that time was running at approximately 390 million lbs./year. Naphthalene was in short supply because of the steel strike, and imports showed signs of drying up as source countries used more of their output for expanding phthalic output.

Phthalic plants now under construction in the U.S. should bring annual capacity up to about 900 million lbs. in '62, and demand will reach about

430 million lbs.—less than 50% of capacity—by the end of that year.

A somewhat brighter aspect, however, is the loosening up of naphthalene supply, and perhaps price—which would help phthalic makers' profit picture. Ashland Oil & Refining Co. has finally ironed out start-up problems at its 100-million-lbs./year Catlettsburg, Ky., naphthalene unit and it is now operating smoothly. Also, Sun Oil's and Tidewater's large naphthalene facilities should become operational during the latter part of '61 or early '62. These new naphthalene sources, plus by-product coal tar naphthalene from increased steel production, suggest a price weakening next year. As indicated, it could mean a better profit margin for phthalic producers—or it could lead to more phthalic price cuts.

But further cuts likely would not stimulate demand and thus solve any of the industry overcapacity problems, any more than the recent price slash

send for new engineering report on

# H<sub>2</sub>OUSTON

water resources for industry

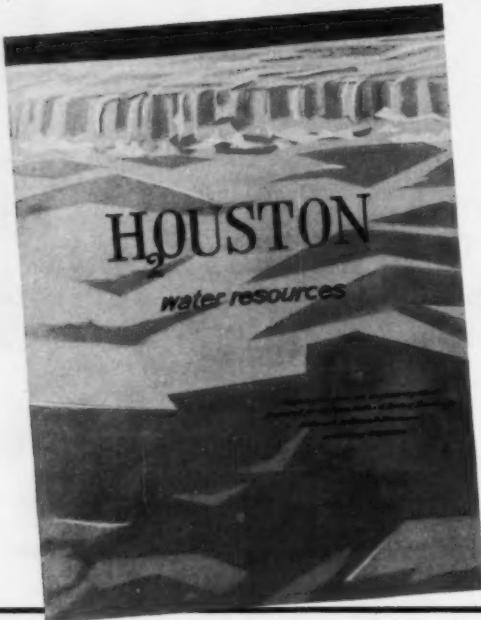
First Comprehensive Study Of Industrial Water Resources In The Houston-Gulf Coast Area For Site-Planners & Investors!

Commemorating our 75th and greatest year of service, the Texas National Bank of Houston recently commissioned the engineering firm of Lockwood, Andrews, & Newnam, Inc. to produce the first comprehensive study of water resources in the Houston area. This invaluable

management tool is now available to all business and industrial planners seeking full information about the nation's fastest growing industrial center.

**SEND FOR YOUR REPORT NOW!**

Includes maps of water supply canals, navigable waterways, supply and demand projections through the year 2,000, surface and ground water supplies, comparative survey of water rates.



To: Texas National Bank of Houston  
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Send \_\_\_\_\_ copies of  
"H<sub>2</sub>OUSTON WATER  
RESOURCES"

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COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_  
(please print)

**Texas National  
Bank**



OF HOUSTON

MEMBER FEDERAL DEPOSIT  
INSURANCE CORPORATION

MARKETS

(Text continued on page 74)

**Phthalic Capacity**  
million lbs./year\*

	Dec. '60	Dec. '62
<b>Allied Chemical</b>		
Buffalo, N.Y.	12	12
Frankford, Pa.	75	100
Ironton, O.	35	35
Chicago, Ill.	35	35
Los Angeles, Calif.	—	25
<b>American Cyanamid</b>		
Bridgeville, Pa.	65	65
<b>Amoco</b>		
Joliet, Ill.	15	15
<b>W. R. Grace</b>		
Fords, N.J.	—	30
<b>Koppers-Pittsburgh</b>		
Kobuta, Pa.	23	25
<b>Monsanto</b>		
St. Louis, Mo.	70	70
Everett, Mass.	40	40
Gloucester County, N.J.	—	40
<b>Oronite</b>		
Richmond, Calif.	18	20
Perth Amboy, N.J.	—	30
<b>Pittsburgh Coke</b>		
Neville Island, Pa.	36	60
<b>Reichhold</b>		
Azusa, Calif.	10	10
Detroit, Mich.	20	20
Elizabeth, N.J.	30	30
Newark, O.	—	60
<b>Sherwin-Williams</b>		
Kensington, Ill.	—	60
<b>Thompson Chemical</b>		
Pawtucket, R.I.	—	10
<b>Union Carbide</b>		
Institute W. Va.	—	50
<b>Witco</b>		
Chicago, Ill.	20	20
Perth Amboy, N.J.	—	30
<b>totals</b>	<b>504</b>	<b>892</b>

\* CW estimates

"ATLAS" has been our name for 49 years...and it still is. However, we're now "Atlas Chemical Industries, Inc."

"Atlas Powder Company," our former corporate name, became less and less descriptive as we grew and diversified into fields other than explosives. Four moves, made since early 1959, emphasize our diversification...

Our Chemicals Division is building a plant to make initially about 50,000,000 pounds per year of glycerin, ethylene glycol and other glycols.

Our Explosives Division is building, and will operate for Solar Nitrogen Chemicals, Inc., a \$15,000,000 facility for making ammonia, urea and related products. Solar is owned equally by Atlas and The Standard Oil Company (Ohio).

Our International Division was formed to take over export of all Atlas products, and to direct and expand manufacturing and marketing operations outside of the United States.

The Stuart Company was recently merged with and into Atlas. As an Atlas Division, it will continue to manufacture and market ethical pharmaceuticals.

The "Powder"—or explosives—business is still important to us, and we expect it to remain so. Diversification into several chemical fields led us to change "Powder" to "Chemical," and to bring all our corporate operations together under "Industries." So, our new official corporate name is "Atlas Chemical Industries, Inc."... while the past lives on as we retain our original NYSE ticker symbol—"APC." We hope you like the new name...and that you'll continue to call us "ATLAS."

**ATLAS**  
CHEMICAL INDUSTRIES, INC.

**CHEMICALS DIVISION**—polyols, emulsifiers, polyester resins, activated carbons, specialty chemicals. ■ **EXPLOSIVES DIVISION**—high explosives, blasting agents, blasting supplies; nitrogen chemicals; ordnance products. ■ **INTERNATIONAL DIVISION**—export; manufacturing and marketing operations outside of the United States. ■ **THE STUART COMPANY DIVISION**—ethical pharmaceuticals.

## MARKETS

### Phthalic Demand

million lbs./year

	'60	'65
Alkyds	165	175
Plasticizers	153	192
Polyesters	38	81
Dyes	16	22
Other	18	20
	390	490

*This announcement is neither an offer to sell nor the solicitation of an offer to buy any of these securities. The offering is made only by the Prospectus.*

New Issue

August 16, 1961

**125,000 Shares**

## Fairmount Chemical Co., Inc.

### Common Stock

(\$1 par value)

**Price \$5.00 Per Share**

*Copies of the Prospectus may be obtained from the undersigned only in states in which the undersigned is qualified to act as a dealer in securities and in which the Prospectus may legally be distributed.*

**ANDRESEN & CO.**

**begin a career with growth and potential**

## APPLICATIONS RESEARCH

IN

## TRANSPARENT FILMS

**BS • CHEMISTS • MS**

**BS • CHEMICAL ENGINEERS • MS**

GENERAL CHEMICAL DIVISION of ALLIED CHEMICAL CORPORATION, a long-time leader in the fields of heavy chemicals, aerosols, refrigerants, fine chemicals, and agricultural chemicals, has recently announced plans to enter the Transparent Films field. This development has created several new opportunities for chemists and chemical engineers with experience in plastics research or applications.

GENERAL CHEMICAL'S recent expansion of its facilities in Morristown, N.J., now affords scientists and engineers the most up-to-date equipment, in modern research environment and surroundings.

Morristown, an historic suburban community, offers an excellent location which is easily accessible to metropolitan New York.

Other opportunities available for chemists and chemical engineers with similar background in technical service.

To arrange convenient interview, send resume to:

**SUPERVISOR OF TECHNICAL EMPLOYMENT**

**GENERAL CHEMICAL DIVISION  
ALLIED CHEMICAL CORP.**

40 Rector St., New York 6, N.Y.



is expected to increase phthalic's demand.

One change the phthalic cuts have caused, however, is a reduction in the price tags of phthalic derivatives. Last week, phthalate plasticizers tumbled 1¢/lb. across the board, and now it's possible that cuts may come in alkyds and polyesters. But so far, no changes have been posted.

But irrespective of this price movement, phthalic anhydride demand is still expected to reach only about 490 million lbs./year by '65.

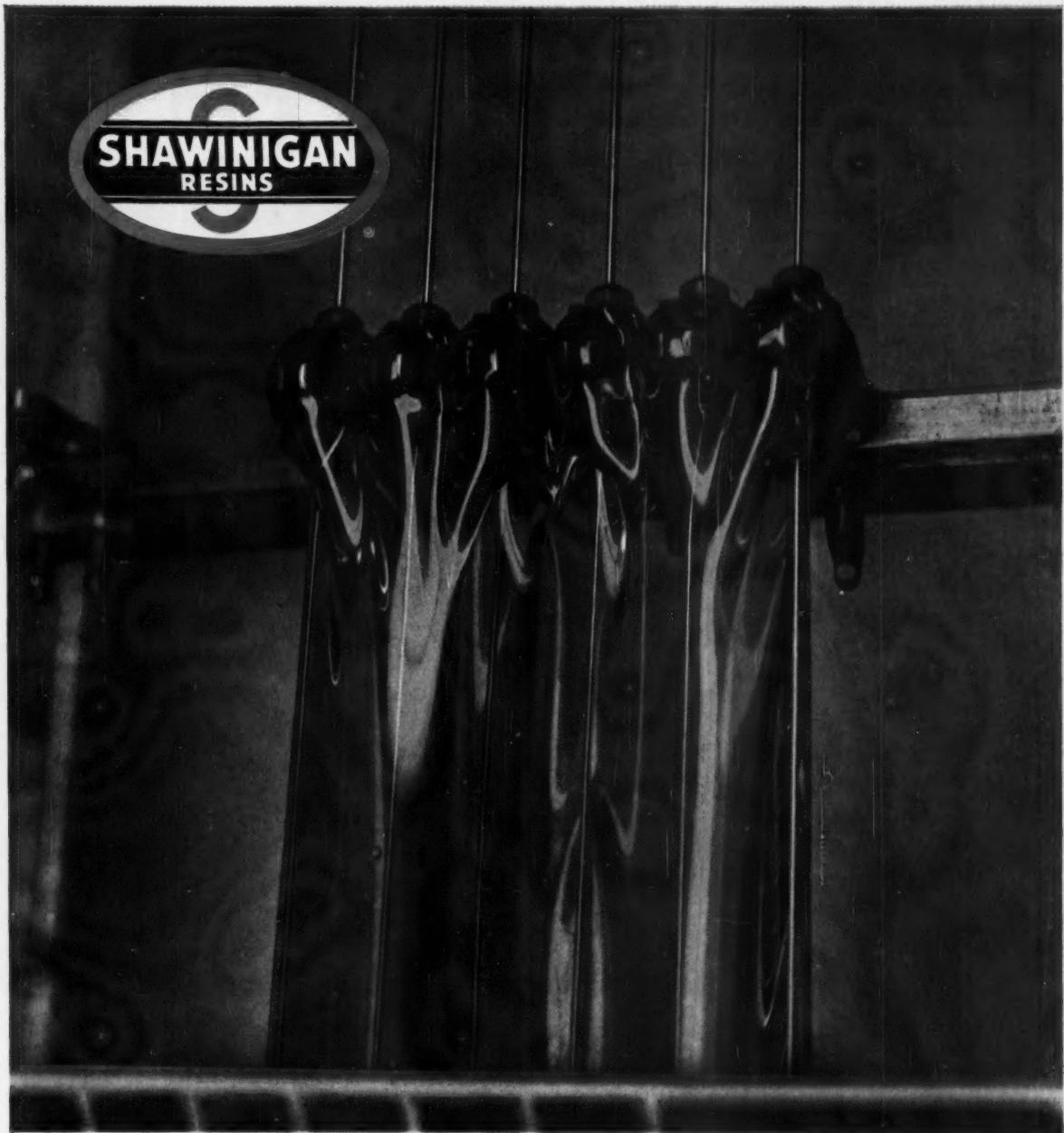
Polyesters will be in the spotlight as the fastest growing end use. Demand in this category is, of course, dependent upon the future of reinforced plastics. And fast growth for reinforced plastics is regarded as a certainty now. In '60, about 38 million lbs. of phthalic went into polyester manufacture as reinforced plastics demand hit 250 million lbs.—two and a half times '55's level of 100 million lbs.

By '65, reinforced plastics production should reach 475 million lbs./year, and phthalic demand in this use 81 million.

Alkyds and plasticizers are the only other important uses. Last year alkyds took 165 million lbs. and plasticizers 153 million. By '65 their take should increase to 175 and 193 million lbs. respectively.

**Slow Growth Areas:** The other phthalic uses consumed about 34 million lbs. in '60 and this total should reach only 42 million lbs./year by '65. There seem to be few new phthalic-based products coming along with any large market stature.

In short, the predictions of phthalic demand made six months ago haven't changed much in spite of lower price tags. Nonetheless, capacity is climbing rapidly, with no alleviation of the excess supply in sight. And if this chemical follows the familiar pattern, a further weakening of prices seems inevitable.



**START OF A BETTER MOTOR** The insulating enamel on magnet wire is the critical factor in electric motor performance. That's why motor manufacturers rely on the rugged dependability of enamels based on FORMVAR® polyvinyl formal resin. For more than 20 years, FORMVAR® based enamels have provided a balance of unsurpassed physical, chemical, and electrical properties. FORMVAR® Resins and new FORMETIC® Enamel are typical examples of Shawinigan's creative research. As specialists in polymer chemistry, we are solving problems and improving products in such varied fields as electrical products, building products, paper, textiles, adhesives, pharmaceuticals, and surface coatings. The answer to your coating or bonding problem is probably in our more than 60 resins, emulsions, and solutions. Or we'll custom-develop it for you. For complete technical details, please write to Department 16.

Shawinigan Resins Corporation, Springfield 1, Massachusetts

September 2, 1961 CHEMICAL WEEK 75

HARDWORKING JEFFERSON CHEMICALS



ETHYLE



Photograph: Courtesy of N. A. Ostenso, Geophysical and Polar Research Center, The University of Wisconsin.

## Dynamite Antifreeze

This 400-pound seismic explosion in Marie Byrd Land, West Antarctica, had an added safety factor . . . ethylene glycol. Pure nitroglycerine freezes at 56° F. By nitrating a mixture of glycerine and ethylene glycol, a nitroglycerine-ethylene glycol dinitrate solution is obtained which resists freezing. This low-freezing dynamite minimizes the dangers associated with the thawing of dynamite prior to use.

Ethylene glycol's ability to depress freezing points, coupled with its high boiling point, leads to its largest use — non-evaporative automotive antifreeze. The market for ethylene glycol antifreezes this year will be some 110 million gallons.

In natural gas processing, triethylene glycol is the most commonly used glycol for dehydration by absorption. Diethylene glycol is preferred in the mixed glycol-amine process which sweetens and dehydrates simultaneously. HI-DRY<sup>(R)</sup>, Jefferson's special grade tetraethylene glycol, is being used in absorption units where additional dew point depression or high contact temperatures are required.

Or your practical applications for ethylene glycols may be in plastics, solvents, plasticizers, or pharmaceuticals. Whatever your applications for glycols, Jefferson can supply your product needs plus helpful technical services.

# ETHYLENE GLYCOLS

MONO-  
DI-  
TRI-  
TETRA-

## SPECIFICATIONS

GLYCOLS:	ETHYLENE	DIETHYLENE	TRIETHYLENE
Water, wt.%	0.30 max.	0.20 max.	0.10 max.
Acidity as acetic, wt.%	0.005 max.	0.005 max.	0.01 max.
Ash, wt.%	0.005 max.	0.005 max.	0.01 max.
Boiling range, ASTM, °C.			
IBP:	195 min.	242 min.	278 min.
DP:	207 max.	250 max.	300 max.
Specific gravity, 15.6/15.6°C.	1.1174 min. 1.1179 max.	1.1190 min. 1.1220 max.	— —
Specific gravity, 20/20°C.	— —	— —	1.124 min. 1.126 max.
Color, Pt-Co scale	15 max.	15 max.	25 max.

## SELECT PROPERTIES

Boiling point, 760 mm., °C.	197.2	244.8	287.4
Flash point (open cup), °F.	240	290	330
Specific heat, cal./gm./°C.	0.544	0.551	0.525
Viscosity, 25°C., centipoise	17.4	—	—
Viscosity, 20°C., centipoise	—	35.7	47.8
Weight, 20° C., lbs./gal.	9.28	9.31	9.36

## SHIPPING AND HANDLING

Ethylene glycols are available from Jefferson in 4,000-, 6,000-, 8,000- and 10,000-gal. tank cars, tank wagons in most areas, and 55-gal. resin-lined drums.

The handling and storage of these glycols is in most cases a straightforward operation. They present no hazard of explosion, polymerization, fire, health, or other industrial risk. They are hygroscopic and have relatively low vapor pressures. There are, however, certain uses requiring extra protection against contamination during handling and storage . . . explained in detail in our technical literature.



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CHARLOTTE • LOS ANGELES • SAN FRANCISCO

## TECHNICAL INFORMATION

Request this Technical Brochure on Ethylene Glycol, mono-, di-, tri- and tetra-, for detailed chemical and physical data . . .

Jefferson Chemical  
Company, Inc., 1121  
Walker Avenue,  
P. O. Box 303,  
Houston 1, Texas.



**JEFFERSON  
CHEMICALS**

516

# New VARSOL® For Long Lasting Sweetness!

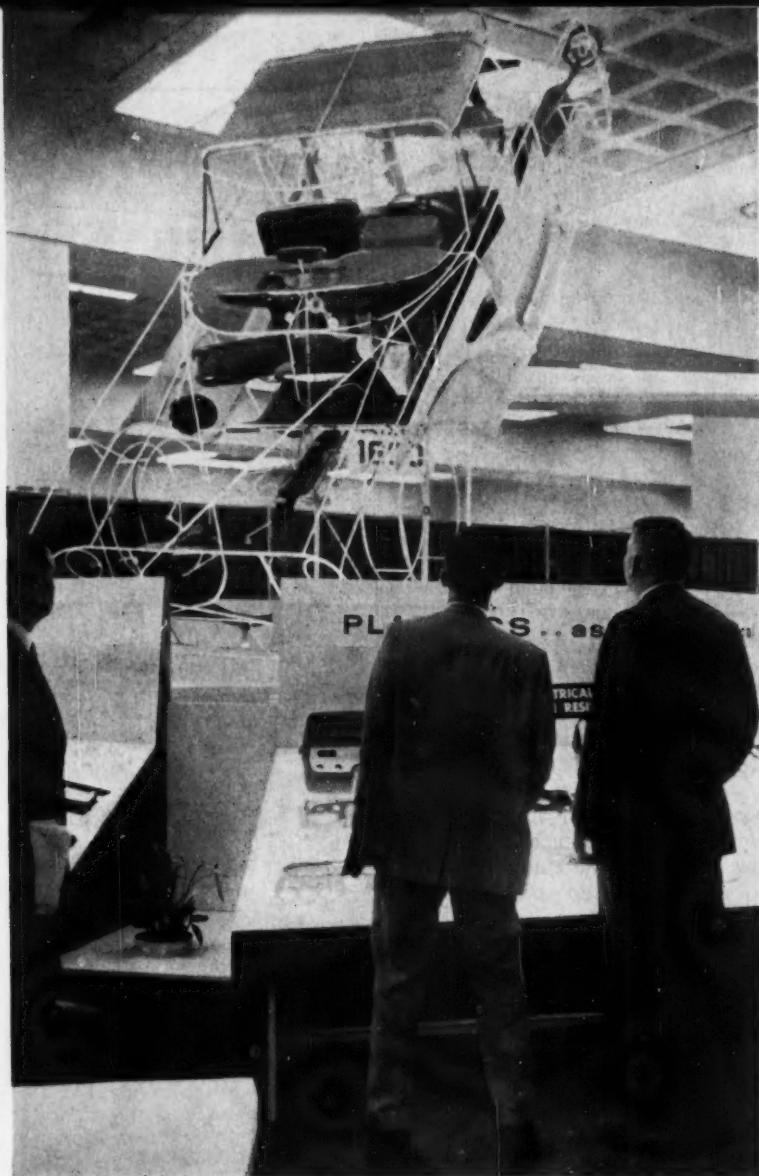


"Why the enthusiasm?

Because users of new, improved Varsol find that it keeps its long lasting sweetness after numerous processings or long storage periods. A unique hydrofining process, developed by Esso Research, makes possible this major solvent development. Quality controlled Varsol, like all Esso solvents, reaches your plant fresh, uniform and on schedule from modern, conveniently located storage terminals. For further information or expert technical assistance call your Esso Representative or write to us at 15 West 51st St., N.Y. 19, N.Y. (And tell 'em Nosey sent you!)” *Nosey*

HUMBLE OIL & REFINING COMPANY





CW PHOTO—JOAN SYDLOW

Glittering automotive plastics display typifies new show methods.

## Are Trade Shows Worth It?

Chemical companies' trade show entries are gaining new attention these days—not only from showgoers attracted by glittering exhibit booths—but also from chemical process industries management men. Concerned by stiff competition and the continuing pinch on profits they're reevaluating trade show promotion plans, making extensive changes as a result.

That's the gist of a just-completed CHEMICAL WEEK survey of CPI advertising and promotion managers. Their replies indicate that showgoers visiting chemical trade expositions—and shows in which chemical companies are represented—are likely to

see some marked changes. Among them:

- Greater selectivity. CPI companies report they are narrowing their list of trade shows, but putting more money and effort into the key shows.
- Emphasis on new products. Fewer firms are content to talk about their standard products. Now, they're building their whole trade show pitch around new items.
- Seeking newer shows. Although there are already over 3,000 trade shows—often too many in a given field—newer shows serving rapidly growing markets are finding a great deal of CPI interest.

**The Show Trap:** Most CPI promotion men believe that they are, "trapped in the agonies of producing ever-new ideas for shows that are often overrated and overcostly."

Essentially, they are concerned about the rising costs of entering big, sophisticated shows without a reliable measure of tangible return. Promotion men still feel uncertain about how much sales mileage they get from their show activities. Norman Gentieu, Foote Mineral's advertising manager, puts it this way: "Dollar for dollar, trade shows can't compete with trade magazine advertising. I can do a lot more with our money put into good trade journal . . . than with any trade show I can think of. [And] the trade show people haven't documented their results or pulling power like the publications-people have."

CW's survey uncovers smoldering resentment about the ever-increasing pressures to build bigger, costlier booths; burgeoning use of dramatic—but often meaningless—devices and "tricks" to attract attention; frequency of shows for chemical products—reported by one ad man to be so high that companies just can't find enough new products to justify their participation.

Extreme examples of "status-seeking" devices are such gimmicks as limousine service from bar to exhibit booth, and closed circuit TV from booth to hotel room. And a host of other less-obvious but still costly practices have sprung up, too.

Besides the high costs and lack of proof of results, promotion men feel that processing equipment dominates many of the bigger CPI shows, making it difficult for a raw materials maker to make his point. And, many of them are withdrawing from shows because they believe that some key buying influences—purchasing and research men—don't get to the shows or else get tied up in meetings, ignoring displays.

**Show Trends:** But CPI ad managers have some good things to say about chemical trade shows, too. Smaller firms value shows for the opportunity afforded them to cover large numbers of prospects from all over the country at low cost. Added benefit: small firm's don't have to make as big—or costly—a splash as the

smells?

**Call on Rhodia  
"Odor Engineering" to solve  
your malodor problems  
in plant or product**

Rhodia Inc. is the world leader in industrial odor control and reodorization technology and a primary producer of industrial aromatic chemicals. It offers fully qualified consultation service anywhere in the United States without cost or obligation.

RHODIA INC.,  
60 East 56 St., New York 22, New York  
Gentlemen:  
Please send me Rhodia literature.  
My problem is: (please give specifics)

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**RHODIA INC.**

60 East 56 St., New York 22, New York  
(Phone: PLaza 3-4850)

**SALES**

industry leaders generally do.

Dow Chemical told *CW* that its '61 show schedule listed 60 shows, 10 more than last year's effort. Some other firms are also increasing the show schedules, but more of them are cutting back. Detrex Chemical Industries, Inc. (Detroit) notes that its '61 program is off somewhat from '60 and Chemetron Corp. is also cutting back.

Corporate identity is getting more emphasis from International Minerals & Chemicals Corp. and B. F. Goodrich.

Among the newer shows that CPI promotion men are keenly interested in: boat, building, computers, nuclear engineering, self-service laundry and fashion.

**More Sophistication:** As shows take on more class, ad men are becoming accustomed to using more color and better lighting, many more audience-participation displays, mechanized presentations. Some firms are using trained animals—such as rabbits to turn electric switches on and off. And some market observers note that the larger companies are beginning to line up their various divisions' or departments' displays for greater concentration. Naturally, booths are being designed for multiple use, but the latest wrinkle is a design with a foreign atmosphere for use at international trade shows, or on world tours.

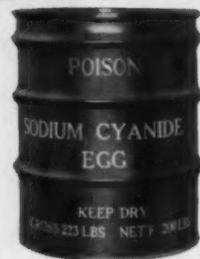
**Specific Pitch:** The emphasis on shows that do an effective promotional job can be seen in the kinds of shows that CPI marketing men favor. Regional shows—which never have had great appeal to CPI—are not considered worthwhile by most ad men queried by *CW*. And traveling exhibits, while useful for very specialized uses (agricultural products), are not popular.

The big, national shows with relatively specialized audiences are most effective, according to chemical promotional men. In these shows advertisers can count on a high proportion of likely sales prospects, a minimum of curiosity seekers.

The biggest of the chemical shows—the biennial Chem Show (Exposition of Chemical Industries) and the annual show sponsored by the American Chemical Society—are not considered prime marketing opportunities by many CPI raw materials ad men, largely because they are becoming dominated by imposing exhibits



## **CYANIDES**



### **When and where**



**you want them**



## **TRICHLOROETHYLENE**

**A complete line of chemical products for industry. Representing —**

- Imperial Chemical Industries Ltd.
- Peter Spence & Sons Ltd.
- Deepwater Chemical Co., Ltd.

## **Chemical Manufacturing Co. Incorporated**

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Murray Hill 8-6700

714 W. Olympic Blvd., Los Angeles 15, Calif.  
Richmond 9-7235

114 Sansome St., San Francisco 4, Calif.  
YUken 6-3787

# can you tell us A BETTER WAY\* . . .

Yes, a surer, more economical way to interest CPI-Management in your exhibit at the 28th EXPOSITION OF CHEMICAL INDUSTRIES than the special November 18th "Chem Show Report" of CHEMICAL WEEK?

Timed to catch the last-minute news before opening day yet early enough for Show-goers to study it thoroughly . . . conspicuously different with its removable insert format . . . complete and comprehensive in content . . . this unique and interpretive magazine-within-the-magazine will be read, referred to and relied on by CW's 48,000 management subscribers before, during and after the Show.

Nowhere else can you target your sales message more accurately to the "traditionally management" audience who will attend the Exposition. And don't forget, you receive big plus values to further merchandise your products and exhibit in the Official CW-CE Directory. No ad space carried but extra attention is assured by bold-faced listing for advertisers in the November 18th issue.

Why wait? Call your CW representative today for all the details . . . and make an early reservation in the "Industry Spokesman for CPI Management." Closing date for the "Chem Show Report" is October 28th. Regular rates apply.

\*to pre-sell more buyers  
at the Chem Show?

# Chemical Week

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## SALES

of process equipment producers.

For the same reasons, the two largest fairs in the world—the Seattle World's Fair of '62, and the New York World's Fair of '64—have incited little significant interest among most chemical producers. Reason, according to one spokesman: "They're way-out of our class."

Only the largest companies—Du Pont, Alcoa, Monsanto—have so far indicated any interest in the New York fair. Du Pont is expected to drive home the theme of strong research in its entry.

**Popular Alternatives:** Doubtless, many cost-conscious CPI marketers have come up with other ways to spend the money they're previously devoted to trade shows. Aside from greater emphasis on more carefully selected shows, some companies are moving in favor of putting additional salesmen on the road. Others have decided to get more trade show mileage with better pre-show promotion. Still others—notably Enjay—have enjoyed conspicuous success by promoting their hospitality suites rather than spending vast sums on ornate booths. Some companies have even given up booths to put all their effort into aisle walking and shoulder tapping, doing their important business in the suites, not in the display areas.

There's little doubt that CPI companies' trade show plans are in for major changes. It will no longer suffice to enter out of force of habit. Instead, each show will be closely evaluated as to its potential for improving the firm's marketing position. If the show doesn't measure up, it faces elimination from the promotion schedule.

### Another Nitrate Study

Ammonium nitrate—one of the chemical process industries' most hazardous and intensively studied products—is in for another investigation of its properties.

The Manufacturing Chemists' Assn. and the Interior Dept.'s Bureau of Mines have signed a contract that will launch an extensive, one-year research program, to be conducted by Bureau's Robert W. Van Dolah. MCA will finance the study, estimated to cost \$60,000. According to the agreement, the research will delve into the fire hazards of ammonium nitrate, as well as nitric acid-hydrocarbon, ammonium

## For Uniform Results in Your Lime Operations

Always Specify

**"MISSISSIPPI"**

the lime of superior purity\*



NOTE HOW SMALL THE MINERS APPEAR AGAINST THE VASTNESS OF A SEGMENT OF MISSISSIPPI'S LIME DEPOSITS

Users, coast-to-coast, in a wide variety of industries, have learned that they can always depend on uniformly superior quality when they specify "Mississippi". By standardizing on Mississippi products you can eliminate uncertainty where lime is used and open the way to improved processes.

No matter what your needs for lime may be, we believe that you'll discover that "Mississippi" can meet them exactly. Our skilled technicians are at your service for consultation with your technical staff. See our specifications in Chemical Materials Catalog.

\*Mississippi Lime Company's entire limestone deposits have a natural purity and uniformity unequalled in such quantity anywhere. The entire formation tests 99% pure calcium carbonate.

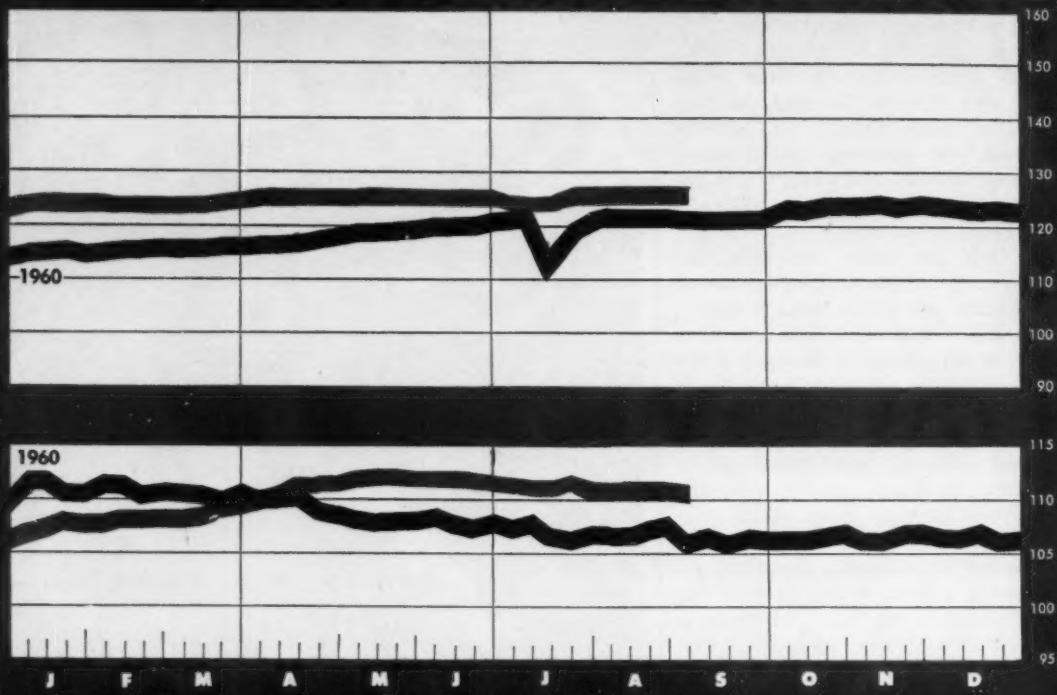
Immediate shipment in any  
quantity anywhere, BY BARGE ...  
BY RAIL ... BY TRUCK

MISSISSIPPI LIME



COMPANY

# BUSINESS BENCHMARKS



SEPTEMBER 2, 1961

#### WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	124.9	125.4	122.5
Chemical Week wholesale price index (1947=100)	110.3	111.1	106.5
Stock price index (12 firms, Standard & Poor's)	56.01	55.68	49.93
Steel ingot output (thousand tons)	1,944	1,910	1,558
Electric power (million kilowatt-hours)	15,665	16,080	14,866
Crude oil and condensate (daily av., thousand bbls.)	7,073	7,045	6,842

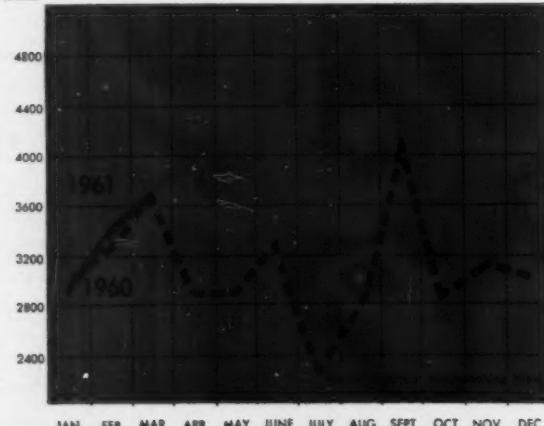
#### MONTHLY INDICATORS—Production (1957=100)

	Latest Month	Preceding Month	Year Ago
All manufacturing	106	111	103
Nondurable goods manufacturing	113	118	109
Durable goods manufacturing	101	106	99
Chemicals and allied products	131	128	125
Industrial chemicals	136	133	129
Petroleum and coal products	116	112	114

#### CHEMICAL CUSTOMERS CLOSE-UP—

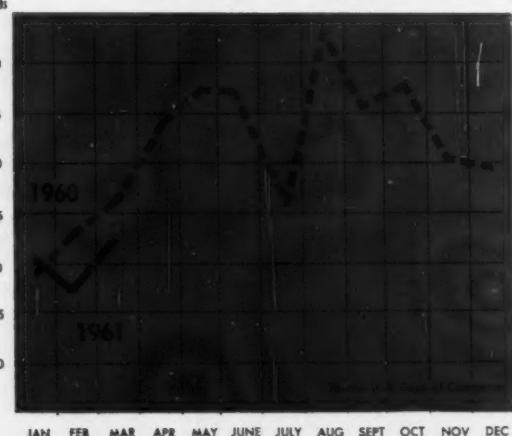
thousand  
of units

#### FACTORY SHIPMENTS OF MAJOR APPLIANCES



million  
pounds

#### SHIPMENTS OF EXPLOSIVES



## SALES

nitrate-urea and combinations of these systems.

Immediate reason for the investigation: last December's train derailment, fire and explosion near Traskwood, Ark. No one has been able to pinpoint the cause of the accident, and MCA believes that an independent agency like the Bureau of Mines may come up with some definite answers.

## Hydrogen Moves Begin

This week, the first coast-to-coast rail shipments of liquid hydrogen were launched by Union Carbide's Linde Co. division. The shipments—using six specially-designed jumbo cars as well as smaller cars and trucks—are part of Linde's \$31-million contract to supply the National Aeronautics and Space Administration with liquid hydrogen for missile launchings.

The cross-country hauls enable Linde to supply NASA's present needs from Eastern plants until the now-being built 26-tons/day Ontario, Calif. plant comes onstream in 'mid '62. Linde is also operating a 6-tons/day liquid hydrogen plant near Torrance, Calif.

The new jumbo cars hold 28,300 gal. of material, would be the largest jumbos on the U.S. rails (in liquid capacity) were it not for the space occupied by the double-skin design, needed to insure minimum evaporation losses. Linde says losses can be kept below 0.3% per day on a 6-day cross country haul.

## Credit Signs Mixed

Last week, CPI credit men received another indication of the industry's credit health: latest quarterly survey by the Credit Research Foundation. The verdict: essentially no improvement over first-quarter '61.

As of July 1, '61, the proportion of chemical company customers who are paying their bills within 30 days lagged to 79.4%, down nearly 2% from first-quarter '61 survey results.

Likewise, the average number of days' sales outstanding mounted to 38, reflecting a steady increase in CPI firms' accounts receivable.

Lone bright spot on the survey was the decrease in long-term receivables. Accounts receivable over 90 days past due dropped to 2.7% from first quarter 3.0%.

# Tracers

## TO THE CHEMICAL PROCESS INDUSTRIES

Published: each Saturday—closes 11 days in advance.

Rate—\$3.00 per line (1.50 per line for position wanted ads), minimum 3 lines. Allow 5 average words as line; Count on half line for box number.

### ADDRESS BOX NO. REPLIES TO: BOX NO.

Classified Adv. of this Publication  
Send to Office nearest you.

P.O. Box 12, New York 36, N. Y.  
645 N. Michigan Ave., Chicago 11, Ill.  
255 California St., San Francisco 11, Calif.

### POSITION VACANT

**Microbiological Evaluation Research-Group Leader.** Excellent opportunity for man with drive and imagination to take charge of operations of microbiological evaluation research group, maintaining effective cooperation with supporting synthesis groups and Development and Sales Departments. Requirements include a Ph.D. in bacteriology with a minor in biochemistry or organic chemistry, with five or more years' industrial research, development or technical sales experience. Should be familiar with bacteriostats, fungistats and germicides; their industrial formulations and applications. Salary commensurate with qualifications. Send resume in confidence to: Mr. H. Scott, Monsanto Chemical Co., Organic Chemicals Division, St. Louis 66, Mo.

### SELLING OPPORTUNITIES AVAILABLE

**Salesmen-The Industrial Chemicals Division of Spencer Chemical Company** is in immediate need of a man with a minimum of five years industrial and organic sales experience. New York location. This man should have a technical degree and be familiar with organic chemicals, latexes, polymers and industrial chemicals. Also other openings are available in Market Development and Sales for men with sales experience in the chemical, latex or textile fields. Please send complete resume to: Personnel Manager, Spencer Chemical Company, 610 Dwight Building, Kansas City, Missouri.

**Sales Representative—Experienced in surfactants** to cosmetics, detergent and chemical industries. Willing to relocate if necessary. Excellent benefits, car and expenses. Reply to Stepan Chemical Co., Edens & Winnetka, Northfield, Illinois.

### POSITION WANTED

**Market Development Sales Advertising Chemical Engineer**, age 36. Successful achievements chemical pharmaceutical industries seeks growth opportunity. PW-7354, Chemical Week.

**Your Organization—is it complete? Are you expanding it? Making replacements?** Naturally, you are anxious to secure the most suitable man or men available. You want men with the special training that will make them an asset to your organization. You can contact such men through an advertisement in this Tracers Section of Chemical Week. Classified Advertising Division, Chemical Week, Post Office Box 12, New York 36, New York.

### SELLING OPPORTUNITY WANTED

**Wanted—Additional lines by man. rep. currently selling paper mills, paint & plastic industry.** Reply RA-7302, Chemical Week.

### CONTRACT WORK WANTED

**Custom Grinding-Ultra Fine or Coarse-Specialty** or Volume Blending and Grinding service on unit or contract basis. Complete  $\text{CO}_2$  installation for Nylon, Teflon and Heat Sensitive Materials. A Cramer Corp., 10881 S. Central Avenue, Box 682 Oak Lawn, Illinois.

## PROFESSIONAL SERVICES

**Clark Microanalytical Laboratory—CH. N. S.** Halogen, Fluorine, Oxygen, Alkoxy, Alkoxide, Acetyl, Terminal Methyl, etc. by specialist in organic microchemical analysis. P.O. Box 17, Urbana, Ill., Empire 7-8406.

**The Consulting Engineer.** "By reason of special training, wide experience and tested ability, coupled with professional integrity the consulting engineer brings to his client detached engineering and economic advice that rises above local limitations and encompasses the availability of all modern developments in the fields where he practices as an expert. His services, which do not replace but supplement and broaden those of regularly employed personnel, are justified on the ground that he saves his client more than he costs him."

## BOOKS

**For recovery of precious metals catalysts, solutions** send for recovery schedule. Precious Metals Recovery Corp., 85 River Road, Nutley 10, New Jersey.

## MISCELLANEOUS

**To Employers Who Advertise for Men:** The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered. When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. (Others do not receive the slightest indication that their letters have even been received, much less given any consideration.) These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bona fide. We can guarantee that Every Advertisement Printed Is Fully Authorized. Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants, mail them marked say "Position filled, thank you." If you don't care to reveal your identity, mail them in plain envelopes. We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements. Classified Advertising Division, McGraw-Hill Publishing Company, "Put Yourself in the Place of the Other Fellow."

## EQUIPMENT FOR SALE

**Multi-million dollar chemical plant at North Little Rock, Ark.** Stainless Steel & glass-lined equip. Send for detailed circular. Perry, 1415 N. 6th St., Phila. 22, Pa.

**Pfaudler 1250 gal. blue-glass lined jacketed reactor, 72" x 72", Agit.** Perry, 1415 N. 6th St., Phila. 22, Pa.

**2600 gal. T316 SS tank, 7' x 8' dished heads, coils.** Perry, 1415 N. 6th St., Phila. 22, Pa.

**For Sale—Over 80,000 Gallons A. O. Smith** Blue Glass-lined Storage Tanks still erected in closed Newark, New Jersey brewery. Available at once. Arrange for inspection now. For details, contact Frank Boitz in Newark at Bigelow 8-6161 or Bigelow 8-3400 or write c/o P. O. Box 3055, Newark 3, New Jersey.

**Proctor & Swartz dryer-steam coils-trays-no** motors. Has both blowers and exhaust fans. Used only for food products. Rozilda Laboratories, Inc., 814 Madison Street, Hoboken, New Jersey.

## CHEMICALS WANTED

**C<sub>8</sub>-C<sub>10</sub> Alcohols (C<sub>8</sub> Av.). Off-grade, low-cost.** Premium sources large continuous quantities wanted. Send details to W-7391, Chemical Week.

## WANTED/FOR SALE

**This Tracer Section can be used whenever you** are looking for or offering Equipment, Plants, Supplies, Chemicals, Opportunities, Special Services. The rates are low—just call or write Classified Advertising Division, Chemical Week, P.O. Box 12, N. Y. 36, N. Y. Longacre 4-3000.

# ONE IVORY TOWER THAT GETS RESULTS

Unlike most ivory towers this one is largely responsible for the remarkable purity of Gulf ethylene. Part of a rigidly controlled process, these fractionators help produce ethylene that converts to polyethylene without additional purification. It is this quality that keeps Gulf ethylene so much in demand. In fact Gulf supplies the chemical industry with more than a million pounds of ethylene a day.

Consistent quality week after week, year after year is one point. The other is immediate availability. Gulf ethylene is literally at your doorstep if you're located anywhere near a 150 mile pipeline that stretches from Port Arthur, Texas to Orange on the northeast and to Houston and Texas City on the west. A two plant complex plus big underground storage reserves keep enough ethylene on hand to meet your needs all the time.

See how Gulf's 8-year, 2.5-billion-pound experience can work to your advantage. Consult our Sales Office, 360 Lexington Ave., New York 17, N. Y.

**QUALITY PETROCHEMICALS TO BEGIN WITH:** Benzene  
Cyclohexane • Ethylene • Oxo Alcohols • Propylene  
Propylene Trimer and Tetramer • Sulfur • Toluene



## TOP QUALITY... HIGH PURITY ETHYLENE WEEK AFTER WEEK

SAMPLE FROM PIPELINE:	1st Week	2nd Week	3rd Week	4th Week	5th Week
<b>Inspection:</b>					
Ethylene: Mol %	100.0	100.0	99.9	100.0	99.9
Methane: Mol %	Nil	Nil	Nil	Nil	Nil
Ethane: Mol %	Nil	Nil	0.1	Nil	0.1
Propylene and Heavier: PPM by Volume	69	Trace	73	38	65
Acetylene: PPM by Weight	4	4	2	2	2
Sulfur: PPM by Weight	5	5	4	3	< 1
Water: PPM by Weight	< 1	< 1	< 1	< 1	< 1
Oxygen: PPM by Weight	< 1	< 1	< 1	< 1	< 1
Carbon Monoxide: PPM by Volume	5	5	5	5	5
Carbon Dioxide: PPM by Volume	< 10	< 10	< 10	10	19
Hydrogen: PPM by Weight	< 1	< 1	< 1	< 1	< 1

PETROCHEMICALS DEPARTMENT, GULF OIL CORPORATION, PITTSBURGH, PENNSYLVANIA



# HF

aqueous and anhydrous

BUFFALO, N. Y.

CHICAGO, ILL.

EL SEGUNDO,  
CALIF.

MARCUS HOOK,  
PA.

CLEVELAND, O.

PITTSBURGH, PA.

NITRO, W. VA.

BATON ROUGE,  
LA.

## General Chemical's supply network is built around your needs for HF

General Chemical's multiple production facilities for anhydrous and aqueous Hydrofluoric Acid make us the *only* supplier to offer shipment from more than one plant! Our plants are located at Baton Rouge, La.; Marcus Hook, Pa.; and Nitro, W. Va. Deliveries of aqueous acid are also made from five strategically-located bulk storage plants in Buffalo, Chicago, Cleveland, El Segundo (California), and Pittsburgh.

This smoothly-coordinated production and delivery system is backed by a long lifeline of raw material sources: fluorspar reserves, mines, mills, and large sulfuric acid capacity.

Call or write your nearest General Chemical office for information, prices, delivery. Make General Chemical your HQ for HF!



GENERAL CHEMICAL DIVISION  
40 Rector Street, New York 6, N.Y.

